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Gas Fluidization of Solids in a Stationary Liquid*

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CONF-841121--1

DE84 006551

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For presentation at the 1984 AIChE Annual Meeting, San Francisco, November 25-29.

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*This work was performed under the auspices of the U.S. Department of Energy.

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Abstract

Critical gas flow rates were measured for fluidizing initially static beds of particles and for settling of fluidized beds in a stationary pool of liquid. Experiments were conducted with beds of glass, nickel and UO_2 particles ranging in size from 11 to 548 µm in pools of water, ethanol, Freon-113 and water-glycerine solutions. Beds of particles smaller than 328 µm were fluidized by a mechanism of individual particles being carried off of walls of channels in the bed, and beds of particles larger than 328 µm slugged before breaking up to a fluidized state. The data were empirically correlated.

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The suspension or fluidization of solid particles in a two-phase gasliquid fluid has been of considerable interest in chemical processes and recently in nuclear safety analysis. Dhir and Catton [1] and Cho, et al. [2] analyzed heat removal from nuclear core debris assuming fluidization of the particulate debris in boiling coolant. Extensive work has been conducted on three phase fluidization with both the liquid and gas phases flowing [3]. However, in batch processes and certain special situations, such as boiling in a bed of nuclear core debris, gas bubbling through a bed of particles in a non-flowing or stationary pool of liquid must be considered.

The critical gas velocity required to completely suspend or fluidize all of the particles in a stationary pool has had some limited investigation. Kato [4] measured the air velocity to completely fluidize glass spheres (74 to 295 μ m) and magnetite particles (74 to 175 μ m) in 0.2 N sodium sulfite solution. Kato correlated the data with the following functional relationship:

$$\frac{U_{mf}}{U_{m}} = f \left[H U_{m} \left(\rho_{s} - \rho_{\ell}\right)/\mu_{\ell}\right]$$
(1)

Roy, et al. [5] correlated their data in terms of the maximum quantity of solids suspended as a function of the bubble velocity. Their empirically developed correlation depended on the superficial gas Reynolds number, Re_{T} , based on the tube diameter.

$$H_{max} = 6.84 \times 10^{-4} \left[Re_{T} N_{B}^{-0.23} \left(\frac{U_{t}}{U_{B}} \right)^{-0.18} (\gamma')^{-3} C_{\mu} \right] Re_{T} < 500$$
 (2)

$$H_{max} = 1.072 \times 10^{-1} \left[\text{Re}_{T}^{0.2} \text{ N}_{B}^{-0.23} \left(\frac{U_{t}}{U_{B}} \right)^{-0.18} (\gamma')^{-3} C_{\mu} \right] \quad \text{Re}_{T} < 600 \quad (3)$$

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where $C_{\mu} = 1 - 0.5892 \log \mu_{\ell} + 0.1026 \log^2 \mu_{\ell}$ (μ_{ℓ} in centipoise).

The data were obtained for various solid materials ranging in size from 127 to 675 μ m and water, alcohol, and various oils.

Narayanan et al. [6] considered the minimum gas fluidization velocity as a pickup velocity in which energy is transmitted from the gas phase to the liquid. The velocity to initiate particle suspension was theoretically determined to be:

$$U_{mf} + \frac{1}{3} \left[2g H_{g} H_{s\ell} \left(\frac{\rho_{\ell} - \rho_{g}}{\rho_{\ell}} \right) \right]^{1/2} = \left\{ 2g(\rho_{s} - \rho_{\ell}) \left[\frac{2}{3} \frac{D_{p}}{\rho_{\ell}} + \frac{H_{s} H_{s\ell}}{\rho_{s} + H_{s} \rho_{\ell}} \right] \right\}^{1/2}$$
(4)

A correction factor to adjust the theoretical value of U_{mf} to that experimentally observed was empirically correlated as a function of solids concentration.

The gas holdup, H_{a} , was empirically determined to be:

$$H_g = 0.062 \text{ U} \qquad U < 6.7 \text{ cm/s}$$
 (5)

$$H_g = 0.133 \ U^{0.38} \quad 6.7 < U < 21.34 \ cm/s$$
 (6)

Their data was based on 84 to 508 µm quartz in water.

Imafuku et al. [7] determined the critical gas velocity to completely suspend the particles in liquid by observing the pressure drop. As for the case of single phase fluidization the pressure drop across the bed increases with gas velocity until the particles are fluidized. After incipient fluidization the pressure drop is independent of gas velocity. They worked with various solid particles ranging from 64 to 180 μ m in size and water and glycerine so¹utions.

While the above cited efforts make a significant contributions in analysis and data, correlations of incipient fluidization in the three-phase system are basically empirical. The mechanisms of transfer of momentum from the gas phase to the liquid and particulate phases are not as simple as for a singlefluid phase flowing through a particle bed. Scheidegger [8] has summarized a considerable amount of work on two-phase flow through packed beds. Tutu. et al. [9] recently experimentally and theoretically analyzed the forces involved in momentum transfer from a flowing gas to beds of 3.18, 6.35, and 12.7 mm stainless steel spheres in a pool of water. These forces include the gas-solid drag, liquid-solid drag, gas-liquid drag, and the surface binding This work on two-phase flow through packed beds is not completely force. applicable to conditions of incipient fluidization. The gas flow through unconfined beds of smaller and less dense particles will force open channels in the bed (this phenomena is described below). This changes the original packing structure and alters the flow distribution through the bed. This structural change as well as the various interacting forces involved severely complicates modelling concepts. However, if the packing remains fixed, the modeling can be simplified. Cho, et al. [2] observed flooding to occur in their bed of rather large dense particles (387 to 650 µm copper) before fluidization began. Therefore, a correlation developed by Wen and Yu [10] for single-phase fluidization could be used since the flooded bed contained essentially no liquid phase. The flooding velocities were calculated using the correlation of Sherwood and Lobo as reformulated by Wallis [11] and were consistently below the observed and calculated incipient fluidization velocities for their copper particle beds.

-3-

Where structural changes occur in the bed, i.e., channel formation, correlations of incipient three-phase fluidization are primarily empirical. Implicit in an empirical correlation is its limitation to the range of variables in the data base. This work contributes additional data to expand the data base and observations which should aid in developing models of incipient three-phase fluidization.

Experimental

Experiments were conducted with Lucite columns 49.3, 50 and 100 mm in diameter (see Fig. 1). Beds of 127 to 548- μ m glass, 311- μ m nickel, and 11- μ m UO₂ particles were fluidized. Water, Freon-113, glycerine-water solutions, and ethanol were used for the liquid phase. The liquid level was at least 50 mm above the bed under static conditions (no air flow). In these tests, the incipient fluidization velocities remained the same with this liquid level or higher levels. Air was dispersed at the base of the beds by a 0.312 mm thick sintered stainless steel plate with an average pore opening of 10 μ m. Pressure taps were in the plenum beneath the gas distributor plate and at the base of the bed just above the distributor plate. The pressure above the plase was measured with a Statham Laboratories PM6TCb pressure transducer, and the pressure below the plate with a Data Sensors, Inc. PB415 D-10 pressure transducer.

The bed pressure drop was determined with the pressure tap just above the distributor plate. The line to this tap had to be continuously flushed with liquid to keep air bubbles from backing into it. The pressure drop across the distributor plate proved inconsistent from experiment to experiment apparently because of partial capillary clogging of the pores in the distributor plate. The air flow was gradually increased until the bed was fluidized. Fluidization was indicated by observation as well as by the pressure drop leveling off without further increase as the air flow was increased. This behavior, which

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Figure 1. Apparatus for Determining Minimum Fluidization Velocities.

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was also observed by Imafuku et al. [7], is identical to fluidization by a single phase fluid. Assuming negligible resistance to air flow by the liquid phase the pressure drop for the fluidized bed is equivalent to the weight of the particle bed. During fluidization the effective density of the liquid phase is increased by the weight of the suspended particles and this is reflected in the pressure at the base.

Results

The minimum fluidization velocity is plotted as a function of static bed depth in Figures 2 to 4. Fig. 2 describes glass-water systems, Fig. 3 glass-Freon-113 systems, and Fig. 4 11- μ m UO₂ in water. A complete data tabulation is given in the Appendix. There is a significant difference in behavior between glass particles 327.5 μ m in diameter and larger in water and for particles 310 μ m and smaller. The incipient fluidization velocity for particles 310 μ m in diameter and smaller is independent of bed depth, whereas it is dependent on bed depth for particles 327 μ m in diameter and larger.

The air flow forced open channels (~ 5 mm wide) in the particle beds of both large and small particles. For beds of the smaller particles, the particles were stripped off the channel walls undil all the particles were suspended. Since the particles were individually removed from the channel walls and carried up into suspension in the liquid pool above the bed, the velocity required for incipient fluidization was independent of the bed depth. However, with larger particles the entire bed was observed to slug up and down off the base before complete breakup to minimum fluidization. Since the entire bed was elevated before large particle fluidization, the incipient fluidization velocity was dependent on bed depth (or bed weight).

-6-



Figure 2. Air Velocities Required to Fluidize Water-Glass Beds.



Figure 3. Air Velocities Required to Fluidize Freon-113-Glass Beds.

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Figure 4. Air Velocities Required to Fluidize Beds of 11 μm UO $_2$ in Water.

The same behavior was observed with the glass-Freon-113 beds. However, the critical particle diameter of 390 μ m was somewhat larger than the 327.5 μ m value for the water system. Buoyancy would be greater in the Freon-113, since Freon-113 is denser (1635 Kg/m³) than water (998 Kg/m³).

The settling velocity was determined by gradually decreasing the air flow after the particulate phase was completely suspended in the liquid pool. There was a hysteresis effect in that the critical velocity for the transition from a suspended bed to a settled bed was lower than that required to initially fluidize a settled bed.

The fluidization mechanism is too complex for theoretical analysis of incipient fluidization at present. The data were analyzed empirically by determining the effect of each parameter on the minimum fluidization velocity. These parameters were combined in the form of dimensionless groups. For the smaller particles in which the minimum fluidization velocity is independent of bed height the data were correlated by (see Fig. 5):

$$\left(\frac{U_{t}}{U_{mf}} \right) \left(\frac{U_{mf}}{U_{p}} \right)^{2} = 8.2 \times 10^{-4} \left[\frac{D_{p}^{3} \rho_{\ell} g(\rho_{s}^{-}\rho_{\ell})}{\mu_{\ell}^{2}} \right]^{0.75} \left[\frac{\sigma}{g D_{p}^{2}(\rho_{s}^{-}\rho_{\ell})} \right]^{0.375} D_{p}^{<328 \ \mu m}$$

or in terms of dimensionless numbers:

$$\binom{U_t}{U_{mf}}$$
 Re_{mf}² = 8.2 x 10⁻⁴ N_f^{1.5} N_{Eo}^{-0.375} D_p < 328 µm (7)

The coefficient 8.2 x 10^{-4} was determined by regression analysis for a curve with a slope of 1. The best least squares fit resulted in a curve with a slope of 0.97 and a coefficient of 9.5 x 10^{-4} . However, the data scatter does not justify this precision.

-10-



Figure 5. Correlation of Minimum Fluidization of Particles Smaller than 328 µm.

The critical velocity for settling of the particles was correlated by (see Fig. 6):

$$\left(\frac{U_{t}}{U_{st}}\right) \operatorname{Re}_{st}^{2} = 8.67 \times 10^{-5} \operatorname{N}_{f}^{2} \operatorname{N}_{Eo}^{-0.50} D_{p} < 328 \,\mu \mathrm{m}$$
 (8)

The critical velocity for settling was not as precisely determined as that for initial fluidization since some judgment was required as to when the fluidized bed began to collapse.

The terminal velocity was calculated from the following:

$$U_{t} = 0.153 \frac{g^{0.71} D_{p}^{1.14} (\rho_{s} - \rho_{\ell})^{0.71}}{\rho_{\ell} \cdot 29 \mu_{\ell}^{0.43}}$$
(9)

The correlations (7) and (8) are somewhat similar to

$$C_{\rm D} \ {\rm Re}^2 = \frac{4}{3} \ {\rm N_f}^2$$
 (10)

used for determining terminal velocities. Rowe [12] used this functional relationship for correlating the minimum fluidization velocity for the single phase flow of either liquid or gas by correcting the coefficient of friction, C_D , by a factor of 68.5 to account for the presence of the neighboring particles. This is consistent with the observed mechanism of small particle incipient fluidization in which individual particles are stripped from the channel walls until the entire bed is suspended.

The 311 μ m nickel particles were somewhat smaller than the smallest size copper particles (387 μ m) used in the tests by Cho, et al. [12]. Since both copper and nickel were the same density, it was of interest to apply the flooding criteria given in Wallis [10] to the 311 μ m nickel particle bed. The flooding velocity was calculated to be about 0.10 m/s, which is less than



Figure 6. Correlation of Critical Settling Velocities of Particles $$$\$ Less Than 328 μm .

observed fluidization velocities. It should be noted that 311 µm is well below the smallest packing size (6 mm) used for the flooding correlation. The minimum fluidization velocity for the 311 µm nickel particles based on a flooded bed with only air flow through the particle bed, using the Wen and Yu [11] correlation is 0.26 m/s. This was below the observed 0.4 to 0.6 m/s range for the three phase system.

For the larger beds in which the minimum fluidization velocity is dependent on bed height the data were correlated by (see Fig. 7):

$$\begin{bmatrix} \rho_{\ell} & U_{mf}^{2} & 1.75 & \frac{\partial^{2} g(\rho_{s} - \rho_{\ell})^{.5}}{D_{p} & g(\rho_{s} - \rho_{\ell})} & \begin{bmatrix} gD_{p} & 1.0 \\ \frac{\partial^{2} g(\rho_{s} - \rho_{\ell})}{U_{mf}} \end{bmatrix} = 77.0 \text{ H}^{.5} D_{p} > 328 \text{ } \mu m$$

or in terms of dimensionless groups:

$$j_{mf}^{*3.5} U_{mf}^{*-.5} Fr_{mf}^{-1.0} = 77.0 H^{.5} D_{p} > 328 \mu m$$
 (11)

The above expression can be simplified to:

$$U_{mf} = 77.0 \frac{H^{5} g^{25} D_{p}^{75} (\rho_{s} - \rho_{l})^{1.25}}{\rho_{l}^{1.75} D_{t}^{1.75} D_{t}^{1.75}} D_{p} > 328 \,\mu m \qquad (12)$$

A least squares analysis indicated that the data would be better correlated with H to the 0.55 power and a constant of 67.9. However, it was felt that the data scatter did not justify this precision. Therefore, a least squares fit was forced to H to the 0.5 power with a resulting constant of 77.0.

The critical velocity for settling of fluidized particles was correlated by (see Fig. 8):



Figure 7. Correlation of Minimum Fluidization of Particles Greater $``` than 328 \ \mu\text{m.}$

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Figure 8. Correlation of Critical Settling Velocities of Particles Greater than 328 $\mu m.$

$$j_{st}^{*3.5} U_{st}^{-.5} Fr_{st}^{-1.0} = 57.7 H^{.5}$$
 D_p > 328 µm (13)

which can be rearranged to:

$$U_{st} = 57.7 \frac{H^{\cdot 5} g^{\cdot 25} D_{p}^{\cdot 75} (\rho_{s} - \rho_{\ell})^{1.25}}{\rho_{\ell}^{1.75} D_{t}^{\mu} \cdot 5} \qquad D_{p} > 328 \ \mu m \qquad (14)$$

Without force fitting, the least squares analysis yielded H to the 0.57 power and a constant 43.1.

The data scatter was greater for the critical settling velocity than for the minimum fluidization velocity, and the data scatter was greater for the larger particles than for the smaller particles. The onset of fluidization was more catastrophic with the larger particles. The entire bed slugged before breaking up into the fluidized state. The breakup of the slugging bed was not as sharply defined as the smoother process of fluidizing the smaller particles individually. The stability of the particulate slugs was sensitive to the column diameter. Within the range of data scatter, the minimum fluidization velocity was observed to be inversely proportional to the column diameter (to the first power). Narayanan et al. [6] assumed a power of 0.5 for particles greater than 200 μm for their correction factor based on work at slurry transport through pipes. Additional data are needed to confirm the column diameter dependency for three-phase fluidization since the current data are limited to one series of measurements with 548 μm glass particles for two different column diameters.

Conclusions

- Bed pressure drop increased with increased gas flow and then leveled off after incipient fluidization in a manner similar as for fluidization with a single phase fluid.
- 2. The critical gas velocity required for fluidization was independent of particle bed depth for particles less than 328 µm. The particles were individually stripped off the channel walls until the entire bed was fluidized.
- 3. The minimum fluidization gas velocity required for beds of particles larger than 328 µm was dependent on particle bed depth. These beds slugged before breaking up into a fluidized state.
- 4. Further work is needed on the effect of tube diameter.
- 5. Further analysis is needed to determine the criterion for beds fluidized by stripping of individual particles off the channel walls and for beds fluidized by breakup of slugging.

NOMENCLATURE

drag coefficient CD C., viscosity correlation factor particle diameter Ðn D+ tube diameter Froude number, $U^2/g D_p$ Fr g acceleration due to gravity Н static particle bed depth Нα gas hold up ΗL static liquid depth H_{max} maximum quantity of solids that can be held in suspension solids concentration, Kg of solid/Kg of liquid He H_{sl} static slurry height $U \rho_{\ell}^{1/2} [g D_{p} (\rho_{s} - \rho_{\ell})]^{-1/2}$ j* bed loading, kg/m^2 L NR modified bubble flow number, $\sigma/U_B \mu_R$ NEÖ Eötvös number, g $D_p^2 (\rho_s - \rho_\ell)/\sigma$ inverse viscosity, $[D_p^3 \rho_{\ell} g (\rho_s - \rho_{\ell})]^{1/2} / \mu_{\ell}$ Nf Reynolds number, U D_p ρ_{g}/μ_{g} Re Ret UDT Pr/Ve superficial gas velocity U $U \mu/D_{+}^{2} g (\rho_{e} - \rho_{e})$ U* bubble velocity U_R U_m terminal velocity of largest particle particle terminal velocity in liquid phase ۷t particle bed voidage ε

- y wettability factor
- $\gamma^* \gamma$ less wettable solid/ γ most wettable solid
- μ_{ℓ} liquid density
- ρ_g gas density
- $\rho_{\boldsymbol{\ell}}$ liquid density
- ρ_S particle density
- σ surface tension
- ψ shape factor

Subscripts

- m_f minimum fluidization
- st settling

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APPENDIX

Table Al. Three-Phase Minimum Fluidization and Settling Velocities

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۳°0	18.0	45.0	48.0	10.01	48.0	0.01	0.01	48.0	10.00 0.00 0.00	5 0 0 0 0 0	2 0 0 0 0 0 0	58.0	28.0	23.0			0 0 0 0	28,0	28.0	.8.0	50°0	28.0	25.0	23° 0		5 - 5 5 - 5 6 - 5 7 - 7 7 - 5 7 - 5 7 - 5 7 - 7 7 - 7 7 7 - 7 7 -	9 ×	5 97				N			28.0 2	28.0	28.6	28.0	28.0	23.0	20.00 20.00	0 0 0 0 0 0 0 0 0	28.0	28.0	28.0	-	59. 19. 19.	0.02 0.02	5 0 2 0 2 0		5 C 0 C 0 C					0.00	28.0	
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st' m/s	22.5	8.1	37	÷	12.	14	12	7 - 1 - 1	+ .	r 19	17.	• 24	23	n e	n n 9 6 1 5	6	2.9	. E7	Ţ.	;	2	3	n i	1. () 7 ()		a <	;;				29					.67	+6.1	1.67	07.			2	2.22	64) 64 -						E		0.00			62.4	0.37	5.2.	
· U _{st} . s cm/s	42 5.75 91 5.74	93 6.28 93 5.73	39 6.37 29 5.37	20 7.75 20 7.75	12.2 62	73 1.21 68 1.14	22 1.14	27 1.74	42 - 1 - 24 9 - 2 - 2 - 2 - 2 - 2 - 2 - 2 - 2 - 2 -	10 1.68	1.74	76 1.74	30 1.74		0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	67 1.39	94 1.67	94 1.67	75 7 ST	75 07	0. N AT	97 N 62			75 5 5 5 5		000 00 000 000 000 000 000 000 000 000				or			21 1.68	22 1.67	22 1.67	22 1.94	22 1.67	55 1.40	NN 1.68		29	76 2.22					10 0. 10 11 0. 12		1	80 V. 75	25 0.00		7.7 00	67 S. 15	47 10.37	89 11.73	
Umf: Ust cm/s cm/s	7 8.42 5.75 7 8.91 5.74	7 9.93 6.28 7 9.93 5.73	7 11.89 6.37	C 11.63 C.35 2 12.79 7.71	7 12.79 7.71	0 1.73 1.21 0 1.68 1.14	0 2.22 1.14	0 2.27 1.74	0 2.27 1.74 0 2 2 2 1 74	0 2.76 1.68	0 2.77 1.74	0 2.76 1.74	6 3.30 1.74			0 1.67 1.39	0 1.94 1.67	0 1.94 1.67	0 2.48 1.94	0 2.40 1.54	0 2 4 9 2 20												0 2.21 1.67	0 1.21 1.68	0 2.22 1.67	0 2.22 1.67	0 2.22 1.94	0 2.22 1.67	0 2.22 1.40			0 1.24 1.67	0 2.76 2.22	0 1.16 2.15 2.15 2.15						0	0 3,80 2,75	7 9.25 0.00	7 7.93 7.74	7 2.27 0.42	7 11.57 9.29	7 13.47 10.37	7 13.39 11.73	
d'unt'ust' dyr <u>es</u> Umf'ust' cm cm/s cm/s	71.97 8.42 5.75 71.97 8.91 5.74	71.97 9.93 6.28 71.97 9.93 5.73	71.97 11.89 6.37	71.97 12.79 7.71	71.97 12.79 7.71	17.30 1.73 1.21 17.30 1.68 1.14	17.30 2.22 1.14	17.30 2.27 1.74		17.30 2.70 1.68	17.50 2.77 1.74	17.30 2.76 1.74	17.30 3.30 1.74		17.20 2.82 2.23	17.50 1.67 1.39	17.30 1.94 1.67	17.30 1.94 1.67	17.30 2.48 1.94	17.30 2.40 1.94	17.30 Z.49 Z.20	10.50 2.75 2.20											17.30 2.21 1.67	17.30 2.21 1.68	17.30 2.22 1.67	17.30 2.22 1.67	17.30 2.22 1.94	17.30 2.22 1.67	17.30 2.22 1.40			17.30 1.94 1.67	17.30 2.76 2.22	17.30 2.76 2.52					17.30 0.50 0.55	17.30 3.54 3.01		71.97 9.25 0.00	12. 12 20.2 20.12	71.97 9.23 8.44	71.97 11.97 9.29	71.97 13.47 10.37	21.97 13.39 11.73	
dyr <u>es</u> Umf. Ust. μ ₂ .Cp cm cm/s cm/s	.894 71.97 8.42 5.75 .894 71.97 8.91 5.74	.894 71.97 9.93 6.28 .894 71.97 9.93 5.73	.694 71.97 11.89 6.97	25.7 62.11 76.17 462.	.894 71.97 12.79 7.71	.680 17.30 1.73 1.21 .680 17.30 1.68 1.14	.680 17.30 2.22 1.14	.630 17.30 2.27 1.74	. 500 17.30 2.27 1.74 .500 17 30 2 52 1 33	.680 17.30 2.76 1.68	.680 17.50 2.77 1.74	.680 17.30 2.76 1.74	.688 17.30 3.30 1.74 500 17 30 5.30 1.74			.650 17.50 1.67 1.39	.680 17.30 1.94 1.67	.630 17.30 1.94 1.67	.680 17.80 2.48 1.94		1530 17.30 2.49 2.20 250 17 20 2.45 2.20	100 12 10 K.70 2.20 200 12 10 2 2 2 2 2 2		. COO 17. 30 3. 30 7. 30 . 680 17. 30 3. 30 7. 30							.650 17.30 1 9.1 1 4.0	620 17.30 2.21 1 22	680 17.30 2.21 1.67	.630 17.30 2.21 1.68	.680 17.30 2.22 1.67	.630 17.30 2.22 1.67	.680 17.30 2.22 1.94	- 680 17.30 2.22 1.67	. 680 17.30 2.22 1.40			.680 17.30 1.94 1.67	. 680 17.30 2.76 2.22	- 680 17 30 2.76 2.22 200 2 20 2.76 2.22						. 680 17.30 3.54 3.01		694 71.97 9.25 0.00	PA-1 20-2 20-12 460	. 244 71.97 9.27 8.24	62.6 19.11 79.17 468.	.894 71.97 13.47 10.37	.894 71.97 13.39 11.73	
Pt, ^d , ^d , ^d , ^u st, g/m ³ µ _k ,Cp cm cm/s cm/s	97.1 .894 71.97 8.42 5.75 97.1 .894 71.97 8.91 5.74	97.1 894 71.97 9.93 6.28 97.1 894 71.97 9.93 5.73	97.1 . 694 71.97 11.89 6.37	12.1	97.1 .894 71.97 12.79 7.71	54.6 .558 17.30 1.73 1.21 64.8 .680 17.30 1.62 1.14	e4.8 .680 17.30 2.22 1.14	64.8 .630 17.30 2.27 1.74	04*00 *000 17*20 2*27 1*74 54.00 *500 17 30 2 32 1 33	64.8 .680 17.30 2.76 1.68	64.8 .680 17.50 2.77 1.74	64.8 .630 17.30 2.76 1.74	04.8 .680 17.30 3.30 1.74 04 0 000 17 30 0.32 1.74	04.00 10.00 10.00 2.77 2.23 64.0 .880 17 50 5 52 5 52	64.8 .630 17.30 3.80 2.91	64.8 .650 17.50 1.67 1.39	64.3 .680 17.30 1.94 1.67	64.8 . 630 17.30 1.94 1.67	64.6 .680 17.30 2.48 1.94	64.6 .680 17.30 2.48 1.94 6. 5 .60 .1 .0	54.0 (500 L/ 30 Z,49 Z,20 24.0 (50 12 20 2.45 2.20			61.0 .680 17.30 2.00 0.19 64.0 .680 17.30 2.50 7.00							64.8 .690 17.30 1 41 1 40	64.6 .620 17.30 2.21 2.62	64.8 .680 17.30 2.21 1.67	54.S . 650 17.30 2.21 1.68	64.8 .680 17.30 2.22 1.67	64.8 .680 17.30 2.22 1.67	64.8 .680 17.30 2.22 1.94	64.8 .680 17.30 2.22 1.67	04.8 .680 17.30 2.22 1.40	01.0 .000 1.30 2.22 1.68 64 2 200 17 30 . 44 . 5	64.8 .680 17.30 1.47 1.47	64.8 .680 17.30 1.94 1.67	64.8 .680 17.30 2.76 2.22						64.0 .680 17.30 3.72 7.75	64.8 .680 17.30 3.54 3.01	64.8 .680 17.20 2.20 2.25	97.1 .894 71.97 9.25 0.00	PA-2 66-2 26-12 468 1.26	77 0 12 5 20 12 768 1.20	97.1 .894 71.97 11.67 9.29	97.1 . 894 71.97 13.47 10.37	97.1 48.94 71.97 13.34 11.73	
ρt,3 dyr⇔s Unf' Ust. .m Kg/m³ μ₂,Cp cm cm/s cm/s	0 997.1 .894 71.97 8.42 5.75 0 997.1 .894 71.97 8.91 5.74	0 997.1 .894 71.97 9.93 6.28 0 997.1 .894 71.97 9.93 5.73	5.0 997.1 .694 71.97 11.39 5.37 10 367 1 661 71 67 11 29	12.2 22.1 22.1 24.2 1.2 1.2 2.2 2.2 2.2 2.2 2.2 2.2 2.2 2	1,0 997.1 .894 71.97 12.79 7.71		0 1544.8 .680 17.30 2.22 1.14	2.0 1564.8 .630 17.30 2.27 1.74 - 0 1551 0 .630 17.30 2.27 1.74		.0 1264.8 .680 17.30 2.76 1.68	4.0 1564.8 .680 17.50 2.77 1.74	0.0 1564.8 .630 17.30 2.76 1.74	6.0 1564.8 .680 17.30 3.30 1.74 5 0 1564 8 .650 17.30 5.30 1.74	**************************************	5.0 1564.8 .630 17.20 3.82 2.23	0.0 1564.8 .650 17.50 1.67 1.39	0.0 1564.8 .680 17.30 1.94 1.67	0.0 1564.8 .630 17.30 1.94 1.67	7.0 1564.6 .680 17.30 2.48 1.94	1.6 1264.8 .680 17.30 2.48 1.94	100 100 100 100 11 100 21 10 21 10 21 10 21 10 1221 10 10 10 10 10 10 10 10 10 10	07.5 57.5 0 500 LC.50 2.75 2.50 V.6 1624 0 200 17 10 2 2 2 2 2 2		1.0 1564.2 .680 17.30 2.30 7.30						6.01564.8 .66012.30 1 23 1 40	J. 0 1564.8 . 650 12.30 1 44 1 40	0.0 1564.6 .620 17.30 2.51 1.75	0.0 1564.8 .680 17.30 2.21 1.67	0.0 1554.5 .550 17.30 2.21 1.68	0.0 1564.8 .680 17.30 2.22 1.67	0.0 1564.8 .680 17.30 2.22 1.67	0.0 1564.8 .680 17.30 2.22 1.94	0.0 1564.8 .680 17.30 2.22 1.67	0.4 1004.8 .000 17.30 2.22 1.40	1.0 1564 2 .000 17.50 2.22 1.60 1.0 1564 2 .000 17 30 . 24		0.0 1564.8 .680 17.30 1.94 1.67	0.0 1564.8 .880 17.30 2.76 2.22	444 1544.8 4680 17.30 2.76 2.25 201451 2 400 2 20 2 2 2					0.0 1564.8 .480 17.30 3.28 2.25	0.0 1564.8 .680 17.30 3.54 3.01	0.0 1564.8 .680 17.30 3.80 2.75	0.0 52.9 71.97 9.25 0.00	12.2 20.2 20.12 468. 1.266 0.0	1.0 947.1 .894.71.97 9.27 8.44	62.6 79.11 79.17 488. 1.796 0.3	1.0 997.1 .894 71.97 13.47 10.37	0.0 997.1 .894 71.97 13.84 1.79	
e H _k ,am Kg/m ³ μ _g ,Cp cm cm/s cm/s	4 163.0 997.1 .894 71.97 8.42 5.75 4 168.0 997.1 .894 71.97 8.91 5.74	4 188.0 997.1 .894 71.97 9.93 6.28 4 188.0 997.1 .894 71.97 9.93 5.73	4 205.0 397.1 .894 71.97 11.89 5.97 4 205 0 307 1 201 71 21 21 22 22	12.4 62.12 12.417 12.21 1.124 1.163 1.26 1.254.0 62.12 1.641 21.62 12.75 62.12	4 224.0 997.1 894 71.97 12.79 7.71	4 12340 1364.6 4680 17.30 1.73 1.21 4 139.0 1564.8 4680 17.30 1.62 1.14	4 139.0 1544.8 .680 17.30 2.22 1.14	4 158.0 1564.8 .680 17.30 2.27 1.74 4 158.0 1564.8 .680 17.30 2.27 1.74	4 10000 100400 • 680 10.30 2027 1.74 4 175.0 1564.0 • 600 17 00 0 0 1 20	+ 175.0 1564.3 .680 17.30 2.76 1.68	4 193.0 1564.8 .630 17.50 2.77 1.74	4 193.0 1564.8 .630 17.30 2.76 1.74	4 205.0 1564.0 630 17.30 3.30 1.74 4 205 0 1564 0 600 17 20 2.02	4 203.0 1064.0 4500 17.00 2.77 2.23 4 223.0 1564.0 4800 17 50 5 50 5 50		4 120.0 1564.8 .650 17.50 1.67 1.39	4 140.0 1564.3 .680 17.30 1.94 1.67	4 140.0 1564.8 .680 17.30 1.94 1.67	4 100.0 1564.6 .080 17.30 2.48 1.94	4 126.6 1264.8 4580 17.30 5.48 1.64 4 159 6 127. 3 450 17.5 5 1.5	1 10010 100110 1000 17 00 2149 2150 1 120 0 1210 12 00 13 00 14 0 1	4 200 6 1624 6 1600 1712 2120 4 200 6 172 2120		4 200.0 1564.2 (680 17.30 2.00 7.49		4 220.0 1564.2 .630 17.30 3 cc			4 145.0 1564.8 .680 17 20 1 77 1 00	4 145.0 1564.8 .650 17.30 1 27 1 40	4 160.0 1564.8 .650 17.30 1 41 1 40	4 160.0 1564.8 .680 17.30 2.21 3.22	4 150.0 1564.8 .680 17.30 2.21 1.67	4 180.0 154.5 .630 17.30 2.21 1.68	4 200.0 1564.8 .680 17.30 2.22 1.67	4 -00.0 1564.8 .630 17.30 2.22 1.67	4 220.0 1564.8 .680 17.30 2.22 1.94	4 440.0 1564.8 .680 17.30 2.22 1.67	4 200.0 1004.8 400 17.30 2.22 1.40	1 4 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	4 140.0 1564.8 .680 17.30 1.67 1.67	4 140.0 1564.8 .680 17.30 1.94 1.67	4 160.0 1564.8 .880 17.30 2.76 2.22	4 150.0 1564.8 .630 17.30 2.76 2.72 4 160 6 164.9 . 500 2.75		4 /00.0 1564.8 .630 17.30 /01 / 21	1 JUD 0 1564.2 . 630 17.20 2.00 2.01	4 ±20.0 1564.3 .630 17.30 3.54 5.47	4 220.0 1564.8 .680 17.30 3.28 2.55	4 240.0 1564.8 .680 17.30 3.54 3.01	4 240.0 1564.8 .680 17.30 3.80 2.75	4 125.0 997.1 .894 71.97 9.25 0.00	4 150.0 997.1 .894 71.97 7.93 7.74	1 120°0 997.1 .894 71.97 9.27 8.44	4 175.0 997.1 .894 71.91 11.97 9.29	4 200.0 997.1 .894 71.97 13.47 10.37	4 200.0 997.1 .894 71.97 13.39 11.73	
t,2 ⁰ , Umf ^{, U} st, /m c H _x ,um Kg/m _{2,2} ,Cp cm cm/s cm/s	.54 .4 163.0 997.1 .894 71.97 8.42 5.75 .54 .4 168.0 997.1 .894 71.97 8.91 5.74	.17 .4 188.0 997.1 .694 71.97 9.93 6.28 .17 .4 188.0 997.1 .894 71.97 9.93 5.73	-80 -4 205.0 997.1 -894 71.97 11.89 6.87 20 -4 205 0 967 1 - 661 7. 67 -1 -2 - 52	12.2 62.11 26.12 469. 1.266 0.427 4.44.	14 - 4 - 5 - 4 - 5 - 5 - 5 - 5 - 5 - 5 -		-27 .4 139.0 1564.8 .680 17.30 2.22 1.14		- 10 - 1 - 100 - 1	54 - 4 175.0 1564.8 - 680 17.30 2.76 1.68	17 .4 193.0 1564.8 .630 17.50 2.77 1.74	17 - 1 193.0 1564.8 - 630 17.30 2.76 1.74	100 4 205.0 1564.8 .600 17.30 3.30 1.74 100 4 200 0 4564 0 .600 47 20 0.47			.63 .4 120.0 1564.8 .650 17.50 1.67 1.39	.27 .4 140.0 1564.8 .680 17.30 1.94 1.67	.27 .4 140.0 1564.8 .630 17.30 1.94 1.67	. 70 . 4 160.0 1564.6 . 680 17.80 2.48 1.94	- 10 - 100-0 100-1 0 - 000 12,30 5-40 1,91 - 11 - 100 0 12/1 0 - 100 1 - 0 - 1	ON NAMES OF A DATE OF A DA			180 4 200 0 1564 2 1680 17 30 3 02 2 49					. 27 . 4 145. U 1564. 8 . 680 17 20 1 27 1 03	.27 .4 145.0 1564.8 .680 17.30 1.23 1.40	130 .4 160.0 1564.8 .680 17.30 1 41 1 40	190 -4 160,0 1564,8 . 680 17,30 2,21 1 42	154 .4 180.0 1564.8 .680 17.30 2.21 1.62	1.54 .4 180.0 1544.8 .830 17.30 2.21 1.68	1.17 .4 200.0 1564.8 .680 17.30 2.22 1.67	117 .4 ±00.0 1564.8 .630 17.30 2.22 1.67	.00 .4 220.0 1564.8 .680 17.30 2.22 1.94 .00 .222 2.22		144 4 200 10448 400 17.30 2.22 1.40	1991 - 1997 - 1994 - 990 - 1977 - 1989 - 1998 - 19 1998 - 1998 - 1998 - 1998 - 1998 - 1998 - 1998 - 1998 - 1998 - 1998 - 1998 - 1998 - 1998 - 1998 - 1998 - 1998 -	·27 ·4 140.0 1564.8 ·630 17.30 1.47 1.47	.27 .4 140.0 1564.8 .680 17.30 1.94 1.67	1,90 .4 160.0 1564.8 .680 17.30 2.76 2.22	- 16 - 4 150.0 (364.8 - 630 17.30 2.76 2.72 - 54 - 4 100 0 457 0 - 700 - 4 - 5 - 5 - 5		11. 4 200.0 1564.8 . 630 17.30 2 61 2 51		100 4 2000 1564.3 .630 17.30 3.54 2.42	- 80 . 4 120.0 1564.8 . 680 17.30 3.22 2.25	144 -4 240.0 1564.8 -680 17.30 3.54 3.01	144 .4 540.0 1564.8 .680 17.30 3.80 2.75	0.0 22.6 71.7 294 71.97 9.25 0.00	• 82 · 4 150.0 997.1 · 894 71.97 7.93 7.74	187 . 1 150.0 997.1 . 894 71.97 9.27 8.44	62 6 15 11 16 11 468 1 1266 0 511 4 00.	51 .4 200.0 997.1 .894 71.97 13.47 10.37	21 . 1 200.0 997.1 . 894 71.97 13.34 11.73	
t,2 ⁰ , ⁰ , ⁰ , ⁰ נוער ג <u>יייי שור לא</u> ישר, שור	0 102.54 .4 163.0 997.1 .894 71.97 8.42 5.75 0 102.54 .4 168.0 997.1 .894 71.97 8.91 5.74	0 128.17 .4 188.0 997.1 . 594 71.97 9.93 6.28 0 128.17 .4 188.0 997.1 .894 71.97 9.93 5.73	0 15/20 4 205.0 997.1 (894 71.97 11.39 6.37 0 15/20 4 205.0 307 (201 7 21.27 5.37	12'2 62'31 26'12 668' 1'266 0'637 6' 60'631 0	0 179444 4 224.0 997.1 8894 71.97 12.79 7.71 0 75 42 1 172 6 1571 0 100 100 100 100 100 100	0 51-27 - 1 139-0 1564.8 - 580 17.30 1.73 1.21 0 51-27 - 4 139-0 1564.8 - 580 17.30 1.68 1.14	0 51.27 .4 139.0 1564.8 .680 17.30 2.22 1.14	(1 76.20) .4 158.0 1564.8 .680 17.30 2.27 1.74 0 26 50 4 150 6 151 0 700 12 00 00 00 00 00 00 00	0 105.54 .4 175.0 1564.0 .500 17.50 2.27 1.74 0 102.54 .4 175.0 1564.0 .500 17 20 2.22 1.22	0 102.54 .4 175.0 1564.8 .680 17.30 2.76 1.68	0 128-17 .4 193.0 1564.8 .680 17.50 2.77 1.74	0 128.17 .4 193.0 1564.8 .630 17.30 2.76 1.74	u 194/00 (4 205/0 1564,8 680 17,30 3,30 1,74 0 15/20 4 205 0 1564 8	0 129.44 .4 223.0 1564.0 . 680 17 50 2.77 2.23 0 129.44 .4 223.0 1564.0 . 680 17 50 2 50 5 50	0 179.44 .4 .2.3.0 1564.8 .630 17.30 3.82 2.23	0 25.63 .4 120.0 1564.8 .650 17.50 1.67 1.39	0 51.27 .4 140.0 1564.3 .680 17.30 1.94 1.67	0 51.27 .4 140.0 1564.8 .630 17.30 1.94 1.67	U (b.20.4 160.0 1564.6 .680 17.30 2.49 1.94	w restand the transmission of the 1.64 (0.100 cm to 1.64 (0.100 cm to 0.100 cm	0.107.54 .1.120.01.004.01.01.01.01.01.01.01.01.01.00 01.01.11.120.01.01.01.01.01.01.01.01.01.01.01.01.01			0 153,80 .4 200,0 1564.2 .680 17.30 3.02 7.49	0 153.80 .4 700.0 1564.3 .830 17.30 2.72 2.72	0 179.44 .4 220.0 1564.3 .630 17.20 2.62			0 51.27 4 145.0 1564.8 660 17 20 1 27 1 05	0 51.27 .4 145.0 1564.8 .680 12 20 1 23 1 40	U 76.30 .4 160.0 1564.8 .620 17.30 1 41 1 40	0 76.90 .4 160.0 1564.6 .620 17.30 2.51 1.75	0 102.54 .4 150.0 1564.8 .630 17.30 2.21 1.67	0 102.54 .4 180.0 1554.5 .530 17.30 2.21 1.68	0 123.17 .4 200.0 1564.8 .680 17.30 2.22 1.67	0 128.17 .4 400.0 1564.8 .630 17.30 2.22 1.67	U 155.60 .4 220.0 1564.8 .680 17.30 2.22 1.94 0 157 00 1 220 2 25 1.94	u 13:00 4 4400 1564.2 .680 17.30 2.22 1.67		0 22°2 0'1'100' 0'100' 0'10'1'1'1'1'1'1'1'1'1'	0 51.27 .4 140.0 1564.8 .630 17.30 1.47 1.47	0 51.27 .4 140.0 1564.8 .680 17.30 1.94 1.67	0 76.90 .4 160.0 1564.8 .680 17.30 2.76 2.22	8 (8-36 4 180.0 1384.8 (630 17.30 2.76 2.22 0 107 54 4 100 0 464 0 (700 6 4 5 5 5 5		0 128.17 .4 200.0 1564.8 .630 17.30 2.01 2.1	0 123-17 - 1 200.0 1564.2 - 630 17.30 2 00 0.00	0 153.00 .4 220.0 1564.3 .630 17.30 3.54 5.45	0 150.80 .4 220.0 1564.8 .680 17.30 3.28 2.55	0 174.44 .4 240.0 1564.8 .680 17.30 3.54 3.01	0 179.44 .4 240.0 1564.8 .680 17.20 3.80 2.75	A 37.93 .4 125.0 997.1 .894 71.97 9.25 0.00	0 75.82 .4 150.0 997.1 .894 71.97 7.93 7.74	0 75.82 t 150.0 947.1 .844 71.97 9.27 8.44	62.6 15.11 16.17 468. 1.746 0.271 4.00.411 W	2 141.91 .4 200.0 997.1 .894 71.97 13.47 10.37	0 14/1 A 200 0 3411 884 21.95 13.34 11.53	
L,2 e.H _{x,} ann Kg/m ³ μ ₂ ,Cp cm cm/s cm/s	68.0 102.54 .4 168.0 997.1 .894 71.97 8.42 5.75 66.0 102.54 .4 158.0 997.1 .894 71.97 8.91 5.74	88.0 128.17 .4 188.0 997.1 .594 71.97 9.93 6.28 88.0 128.17 .4 188.0 997.1 .894 71.97 9.93 5.73	- 105.0 15.30 .4 205.0 997.1 .894 71.97 11.89 6.97 - 105.0 152.00 4 205.0 907.1 .601 7.07 11.89 6.97	12'2 62'31 26'12 468' 1'266 0'437 + 44'11'12'13' 12'2' 2'31'	1 124.0 179.44 .4 224.0 997.1 .894 71.97 12.79 7.71 1 23 6 26 27 1 122 6 1521 2 202 2 20 2 2 2 2		33.0 51.27.4 139.0 1564.8 .680 17.30 2.22 1.14	· 53.0 75.30 .4 153.0 1564.3 .630 17.30 2.27 1.74 5 3.0 75 30 4 150 6 1551 6 700 17 20 2.27 1.74		· 75.0 102.54 .4 175.0 1564.8 .680 17.30 2.76 1.68	93.0 128.17 .4 193.0 1564.8 .680 17.50 2.77 1.74	1 93.J 128.17 .4 193.0 1564.8 .680 17.30 2.76 1.74 105 0 150 00 1005 0101	· 105.0 153.00 4 205.0 1564.8 • 680 17.30 3.30 1.74 2 105.0 152.20 4 205 0 1554 2 2 20 2 2 2 2 2 2 2 2 2 2 2 2		- 122.0 179.44 .4 123.0 1564.8 .630 17.30 3.82 2.23	20.0 25.63 .4 120.0 1564.8 .650 17.50 1.67 1.39	: 40.0 51.27 .4 140.0 1564.3 .680 17.30 1.94 1.67	44.6 51.27 .4 140.0 1564.8 .630 17.30 1.94 1.67	· *0.0 /6.70 .4 160.0 1564.6 .680 17.30 2.48 1.94	· · · · · · · · · · · · · · · · · · ·	· ····································				1 100.0 153.80 .4 200.0 1564.3 .620 17.30 2.72 2.72		(120. v 173. 44 .4 220. 0 1564. 8 .600 17 30 3.00 5.00			: 45.0 51.27 .4 145.0 1564.8 .6%0 12 20 1 27 1 40	: 60.0 76.30 .4 160.0 1564.8 .620 17.20 1 44 1 40	c 60.0 76.90 .4 160.0 [564.6 620 17.30 2.21 1.22	20.0 102.54 .4 150.0 1564.8 .680 17.30 2.91 1.67	: 80.0 102.54 .4 180.0 1554.5 .630 17.30 2.21 1.68	100.0 123.17 .4 200.0 1564.8 .680 17.30 2.22 1.67	1 100.0 123.17 .4 ±00.0 1564.8 .630 17.30 2.22 1.67	· 140.0 103.40 .4 220.0 1564.8 .680 17.30 2.22 1.94	- 149-0 123-09 4 420-0 1564.2 - 630 17.30 2.22 1.67	· • • • • • • • • • • • • • • • • • • •			: 40.0 51.27 .4 140.0 1564.8 .680 17.30 1.94 1.67	: 50.0 76.90 4 160.0 1564.8 . 580 17.30 2.76 2.22	1 2010 1012 1014 1014 1014 1014 1015 1015 1015 1015		· 100.0 122.17 .4 200.0 1564.8 .630 17.30 2.61 2.5	: 100.0 123.17 .1 200.0 1564.2 .630 17 20 2 00 A 00	: 120.0 153.00 .4 .20.0 1564.3 .680 17.30 3.54 2.42	0 120.0 150.80 .4 220.0 1564.8 .480 17.30 3.28 2.55	140.0 174.44 .4 240.0 1564.0 .680 17.30 3.54 3.AI		0.0 27.9 71.510 997.1 1.89.71.97 9.25 0.00	1 50.0 75.82 .4 150.0 997.1 .894 71.97 7.93 7.74	1 20.0 75.82.4 150.0 997.1 .894 71.97 9.27 8.44	62.5 15.11 16.11 168. 1.166 0.511 1.00.111 0.52	100'0 147'91 '4 200'0 997'1 '894 71.97 13'47 10'37	52,11 55 13 14,12 16,12 16,0 16,0 17,12 16,241 16,000 .	
L.2 P.1.3 P.1.3 Dt.am Kg/m ³ P.2.5 Cm Cm/s Cm/s Cm/s	49.8 68.0 102.54 14 168.0 997.1 894 71.97 8.42 5.75 49.8 65.0 102.54 4 158.0 997.1 894 71.97 8.91 5.74	49.8 88.0 120.17 .4 188.0 997.1 .594 71.97 9.93 6.28 49.8 83.0 123.17 .4 188.0 997.1 .894 71.97 9.93 5.73	49.8 105.0 15.480 .4 205.0 997.1 .894 71.97 11.89 6.97 49.3 105 3 152 00 -1 205 0 997 1 - 601 7. 02 1 2 2 2	14'2 52'12 12 12 13 13 13 13 13 13 13 13 13 13 13 13 13	43.8 124.0 179.44 .4 224.0 997.1 .894 71.97 12.79 7.7 49 0 00 0 05 47 1 100 0 154.0 100 100 100 100 100 100	49.3 33.0 51.27 4 139.0 1564.8 . 550 17.30 1.73 1.21	49.8 39.0 51.27.4 139.0 1564.8 .680 17.30 2.22 1.14	4%,5 5%,0 76,%),4 158,0 1564,8 .680 17,30 2,27 1,74 4%,8 53,0 28,90 4 158,0 1564,8 750 4 20 20 2,27 1,74		49.3 75.0 102.54 .4 175.0 1564.8 .680 17.30 2.72 1.68	49.0 93.0 128.17 .4 193.0 1564.8 .630 17.50 2.77 1.74	49.0 93.0 128.17 .4 193.0 1564.8 .630 17.30 2.76 1.74	42:2 105:0 15:00 .4 205.0 1564.8 .650 17.30 3.30 1.74 44.5 105.0 15:20 -1 205 0 1554 0 - 550 17 20 2.30		49.8 122.0 179.44 .4 .23.0 1564.8 .630 17.30 3.82 2.23	45.3 20.0 25.63 .4 120.0 1564.8 .650 17.50 1.67 1.39	49.3 40.0 51.27 .4 140.0 1564.3 .680 17.30 1.94 1.67	43.6 40.6 51.27 .4 140.0 1564.8 .630 17.30 1.94 1.67	47.3 80.0 76.39 .4 160.0 1564.6 .680 17.30 2.48 1.94 19 8 60 0 76 00 1 100 155 15 10 10 10 10	43.3 20.0 10.10.21 11.100.0 1004.0 1004.0 10.00 17.30 2.40 1.54 49.3 20.010.102.54 4.155 5.155 5.155 5.55 5.55 5.55 5.5	40.6 Sürü 103.54 tariya tariya tariya 1500 17.49 2.49 2.50	02.2 2/2 02.10 10.0 10.00 0.000 0.000 0.00 10.00 2.20 2.2		49.3 100.0 153.80 .4 200.0 1564.2 .680 17.30 2.45 7.55	42.8 100.0 153.80 .4 200.0 1564.3 .680 17.30 2.72 2.72		1.5.5.1.5.1.5.5.5.5.5.5.5.5.5.5.5.5.5.5			42.0 45.0 51.02 4 145.0 1564.8 . 660 17 50 1 63 1 0	49.2 60.0 76.90 4 160.0 1564.3 .820 17.20 1 41 1 40	49.0 60.0 76.90 4 160.0 1564.6 .680 17.30 2.51 1.52	49.8 80.0 102.54 .4 180.0 1564.8 .680 17.30 2.21 1.67	42.8 80.0 102.54 .4 180.0 1554.5 .630 17.30 2.21 1.68	49.8 100.0 123.17 .4 200.0 1564.8 .680 17.30 2.22 1.67	49.8 100.0 123.17 .4 ±00.0 1564.8 .680 17.30 2.22 1.67	43/3 120.0 133/30 .4 220.0 1564.8 .680 17.30 2.22 1.94 46 3 130 0 152 00 1 230 0 151.			49.5 20.0 22.63 1 100.0 1201.0 1001.0 1000.0 1000 200 1.60	42.5 40.0 51.27 .4 140.0 1564.8 .630 17.30 1.87 1.87	49.0 40.0 51.27 .4 140.0 1564.8 .680 17.30 1.94 1.67	49.2 60.0 76.90 4 160.0 1564.8 .680 17.30 2.76 2.22	14.5 St.5 15.5 15.5 15.1 15.1 15.1 15.1 15.1 1		49.0 100.0 128.17 4 200.0 1564.8 .630 17.30 2 01 2 1	42.3 100.0 123.17 1 100.0 1564.2 . 630 17.20 2 00 A D	49-8 120-0 153.00 .4 220-0 1564.3 .630 17.30 3.54 2.42	49.5 120.0 153.80 4 220.0 1564.8 480 17 30 3.28 2 55	49.8 140.0 179.44 .4 240.0 1564.8 .680 17.30 2.54 3.01	49.8 140.0 179.44 .4 240.0 1564.8 .680 17.30 2.80 2.75	100.0 25.0 37.93 4 125.0 997.1 .894 71.97 9.25 0.00	100.0 50.0 75.82 .4 150.0 997.1 .894 71.97 7.93 7.74	100.0 50.0 75.82 .4 150.0 997.1 .894 71.97 9.27 8.49	100.0 75.0 114.00 4 175.0 997.1 . 894 71.97 11.97 9.29	100.0 100.0 147.91 .4 200.0 997.1 .894 71.97 13.47 10.37	52,11 45,51 26,12 468, 1,266,0,000 4, 16,241 0,000	
s * Dt.am H.am Kg/m ² ε H _x .am Kg/m ³ μ _x .Cp cm cm/s cm/s cm/s	110 49.8 68.0 102.54.4 168.0 997.1 .894 71.97 8.42 5.75 110 49.8 68.0 102.54.4 168.0 997.1 .894 71.97 8.91 5.74	11.0 49.8 88.0 128.17 .4 188.0 997.1 .694 71.97 9.93 6.28 -1.0 49.8 88.0 128.17 .4 188.0 997.1 .894 71.97 9.93 5.73	1 1.0 49.8 105.0 15.480 .4 205.0 997.1 .894 71.97 11.89 6.97 11.0 49.0 105 0 152 00 4 205 0 967 1 964 71 97 11.5 5 5.97	12 52 52 12 12 12 12 12 12 12 12 12 12 12 12 12	1 1.0 43.8 124.0 179.44 .4 224.0 997.1 .894 71.97 12.79 7.71	1.0 49.3 39.0 51.27 .4 139.0 1564.8 .660 17.30 1.73 1.21	11.0 49.8 39.0 51.27 4 139.0 1544.8 .680 17.30 2.22 1.14	• 1.0 −4%,5 °5%,0 °76,20 °4 158,0 1564,8 °680 17,30 2,27 1,74 • 1.0 42,8 53,0 55,90 4 58,0 156,0 56,0 700 17,0 2,27 5 5	11.0 45.3 75.0 102.54 .4 175.0 1554.8 .580 17.50 2.57 1.74	11.0 49.0 75.0 102.54 .4 175.0 1554.8 .680 17.30 2.76 1.68	11.0 49.0 33.0 128.17 .4 193.0 1564.8 .630 17.50 2.77 1.74	1 1.0 49.0 43.0 128.17 4 193.0 1564.8 . 630 17.30 2.76 1.74	1 1.0 43.0 105.0 153.00 .4 205.0 1564.8 .660 17.30 3.30 1.74 1 1.0 49.0 105.0 153 20 4 200 0 1554 2 200 12 20 2 20 2 20 2 20	11.0 49.8 123.0 139.44 .4 223.0 1564.0 . 680 17 30 2.77 2.23		0 1.0 45.3 20.0 25.63 .4 120.0 1564.8 .630 17.50 1.67 1.39	0 1.0 49.3 40.0 51.27 .4 140.0 1564.3 .680 17.30 1.94 1.67		7 1.0 47.5 50.0 75.90 4 150.0 1554.5 559 17.30 2.49 1.94	11.0 49.8 80.0 10.51 4 150.0 1264.8 1580 17.30 2.48 1.54	11.0 40.6 80.0 102.54 .4 120.0 1554 0 1554 0 200 17.50 2.49 2.20			0 1.0 49.3 100.0 153.80 4 200.0 1564.2 580 17.30 3.02 7.43	110 42.8 100.0 153.80 4 200.0 1564.3 880 17.50 5.75 5 7 5						11.0 43.2 60.0 76.30 4 160.0 1564.3 .650 17.30 1 41 1 40	11.0 49.0 60.0 76.90 4 160.0 1564.5 .680 17.30 2.91 175	11.0 49.3 80.0 102.54 .4 150.0 1564.8 .630 17.30 2.21 1.67	0 1.0 49.8 80.0 102.54 .4 180.0 1554.S .650 17.30 2.21 1.68	J 1.0 49.8 100.0 123.17 .4 200.0 1564.8 .680 17.30 2.22 1.67	0 1.0 49.8 100.0 123.17 .4 ±00.0 1564.8 .630 17.30 2.22 1.67	7 1.0 43.5 120.0 155.60 .4 220.0 1564.8 .680 17.30 2.22 1.94					0 1.0 49.0 50.0 51.27 .4 140.0 1564.8 .680 17.30 1.94 1.67	7 1.0 49.5 60.0 76.90 4 160.0 1564.8 .880 17.30 2.76 2.22	11,0 46,2 80,0 10,51 4 150,0 154,8 680 17,30 2,75 2,25 11,0 46,3 80,0 10,51 4 100 6 4671 5 700 17,30				11.0 49.8 120.0 153.00 4 220.0 1564.3 680 17.30 3.54 5 17		1,0 49.8 140.0 179.44 .4 240.0 1564.8 .680 17.30 7.41 7.10		0.0 52 6 26.12 468. 1.266 0.511 4.86.28 0.52 0.601 0.11	1.0 100.0 20.0 75.82 .4 150.0 997.1 .894 71.97 7.98 7.74	1.0 100.0 50.0 75.52 . 150.0 527.1 . 254.71.57 5.27 8.44	62'6 46'11 46'11 468' 1'166 0'311 4' 00'411 A'52' 0'001 A'1	1.0 100 0 100 0 101 0 10 100 0 000 10 100 0 000 0 10 000 0 10 00 0	24.11 65.21 26.12 668. 1.260.0 66.1 15.241 0.001	
Ps, Unf. Ust. Kg/ms ¥ Dt.am H.am Kg/m č R _x .am Kg/m ² μ ₂ .Cp cm cm/s cm/s	2600 1.0 49.8 68.0 102.54 4 168.0 997.1 894 71.97 8.42 5.75 2600 1.0 49.8 68.0 102.54 4 168.0 997.1 894 71.97 8.91 5.74	2600 1.0 49.8 88.0 120.17 .4 188.0 997.1 .694 71.97 9.93 6.28 2600 1.0 49.8 83.0 123.17 .4 188.0 997.1 .894 71.97 9.93 5.73	2600 L.0 49.8 105.0 15.80 4 205.0 997.1 .694 71.97 11.89 6.97 2600 L.0 49.0 105 0 152 00 4 205 0 607 1 601 7:07 1 22 5 2	12.2 62.11 26.12 468. 1.266 0.427 4. 44.41 0.421 0.426 0.1 0.0037	2600 1.0 49.8 124.0 179.44 .4 224.0 997.1 .894 71.97 12.79 7.71 3500 1.0 49.8 23.0 45.22 1.123.6 1521 0 420 10 42	2000 1.0 49.3 39.0 51.27 4 139.0 1564.8 . 660 17.30 1.73 1.21	2600 1.0 49.3 39.0 51.27 .4 139.0 1564.8 .680 17.30 2.22 1.14	2000 1.0 49.5 53.0 76.90 .4 153.0 1564.8 .630 17.30 2.27 1.74 2000 1.0 44.3 53.0 25.50 4 152.6 1551.0 2004 30 2 2 2	2000 1.0 49.3 75.0 102.54 .4 175.0 1554.8 .504 17 30 2.27 1.74	2600 1.0 49.0 75.0 102.54 .4 175.0 1564.8 .680 17.30 2.76 1.68	2630 1.0 49.0 93.0 128.17 .4 193.0 1564.8 .630 17.50 2.77 1.74	Zeun i.u. 49.2 93.0 128.17 .4 193.0 1564.8 .630 17.30 2.76 1.74 2500 1 0 40 105 0 152 00 1005 0 1005	zeou (rv. 42:0 105:0 155:00 14 205:0 1564.8 - 660 17:30 - 3:30 1,74 2600 1.6 49:8 105:0 15:20 - 4 200 0 1554 2 - 560 12 25 2 25 2 25	2000 1.0 49.8 123.0 179.44 .4 223.0 1564.0 .880 17.30 2.77 2.23	2600 1.0 49.8 122.0 179.44 .4 123.0 1564.8 .680 17.30 2.82 2.23	2600 1.0 49.3 20.0 25.63 .4 120.0 1564.8 .650 17.50 1.67 1.39	2600 1.0 49.3 40.0 51.27 .4 140.0 1564.3 .680 17.30 1.94 1.67	2000 10 13.30 10 10 21.27 4 140.0 1564.8 .030 17.30 1.94 1.67						2600 1.0 49.3 100.0 153.80 4 200.0 1564.2 680 17.30 5.05 7.5 5	2600 1.0 42.0 100.0 153.80 .4 200.0 1564.3 .500 17.50 2.72 2.72		2600 1.0 49.8 120.4 179.44 .4 220.0 144.48 . 200 11.00 12.00 22.00 24.4		2600 1.0 49.0 45.0 51.27 4 145.0 1554.2 550 17 20 1 77 1 20	2000 1.0 49.0 41.00 51.00 4 145.0 1564.8 .680 17.30 1 43 1 40	2600 1.0 49.2 60.0 76.90 4 160.0 1564.3 .650 12.20 1 40 1 40	2001 1.0 49.0 00.0 76.50 4 160.0 1564.5 .680 17.30 2.51 1.55	2600 1.0 49.3 80.0 102.54 .4 150.0 1564.8 .680 17.30 2.91 1.67	2600 1.0 47.8 80.0 102.54 .4 180.0 1544.5 .680 17.30 2.21 1.68	2000 1.0 49.6 100.0 123.17 .4 200.0 1564.8 .680 17.30 2.22 1.57	2000 1.0 49.2 100.0 123.17 .4 .00.0 1564.3 .630 17.30 2.22 1.67					2000 1.0 49.2 40.0 51.27 4 140.0 1564.8 680 17.30 1.47 1.47	2600 1.0 49.0 40.0 51.27 .4 140.0 1564.8 .680 17.30 1.94 1.67	2000 140 4943 6040 76,90 4 16040 1564.8 .680 17,30 2.76 2.22	2000 1.0 49.3 20.0 10 54 4 100.0 1564.8 200 17.30 2.75 2.22 2600 1.0 49.3 20.0 10 54 4 100 6 454 5 50 50 50 50 50 50 50 50 50 50 50 50 5		2500 1.0 49.0 100.0 122.17 4 200.0 1554.8 5530 17.30 2 0 0 0 0	2000 1.0 49.3 100.0 120.17 1 100.0 1564.2 1600 17.30 2 0 0 0 0	2600 1.4 49.8 120.6 153.20 4 220.0 1544 3 680 17.20 344 244 244	2000 1.0 49.5 120.0 151.60 .4 220.0 1564.8 .680 17.30 2.52 2.5 25	2600 1.0 49.8 140.0 174.44 .4 240.0 1564.8 .680 17.30 2.44 2.01	2000 1.0 49.8 140.0 179.44 44 240.0 1564.8 580 17.30 3.80 2.75	00.9 52.6 26.12 468. 1.266 0.311 4.86.22 0.001 0.10032	Zeuri 1.0 100.0 20.0 75.82 .4 150.0 997.1 .894 71.97 7.93 7.74	2 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	62.6 16 11 16 11 168. 11166 0.511 1.00.111 0.52 0.001 0.1 002	2000 10 10 10 10 10 10 10 10 10 10 10 10	52,11 45,51 79,15 468, 1,500,0 997,1 200,0 421,19,19,19,19,19,20	
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TABLE A1. (cont'd)

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U _{st} . cm/s		90.94 12.24	11.39	6,09	0.00	0 0 0 0 0	3.15	7 . 	* 1 * 0	うい () () () () () () () () () () () () ()	3.11	4.52	3, 83 5	11.38			13. 36	12.30	17.57	14.77	23.75	23.70	1			10.00	16.03	13, 22	17.21	2.12			5	5.50	30 6 6	0.00	63.5	ວງ ີ ທີ	8.21	0	0.0	5	10.45	0.50		15.37	11.58	11.76	13.77	18.29	15, 15	15.30	18.21	18,28	18,60	15.60
°n m°s C∭∖s		14.76	13.97	21.43	0.00	6.72	10.57	10.56	200	12.0	9.75	9.60	9.00		19.96		0000	19.03	25.46	25.59	28.72	50.07	16. 21			17.17	21.99	21.99	23.67	23. 6V	0 0 0 0	8.73		8. 6.9	0.'s		3.78	7.17	10.34	10.39	11.62	11.65	12.79	11.69	14.93	18.01	18.42	19. 78	19.84	21.04	17.88	17.02	20.93	20.99	21.36	64.10
e sine	01 60	21.50	21.50	21.50	21.50	51.50 51.50	21.50	21.50	20.12	21.50	21.50	21.50	21.50	NU - 10	21.50	1.5	21.50	21.50	21.50	21.50	21.50	21.50			0111	21.50	21.50	21.50	21.50			21.50	21.50	21.50		21.50	21.50	21.50	21.50		21.50	21.50	21.50		21.50	21.50	21.50	21.50	21.50	21.50	21 50 2	21.50	21.50	21.50	21.50	21.50
9 2		1.100	1.160	1.100	1.100	. 100	1.160	1.100	1.166	1.100	1.100	1.100	1.100	001-1	. 100	1.100	1.100	1.100	1.100	1.100	1.100	1.160	0.01		1.160	1.100	1.180	1.100	1.100	801.1		1.100	1.100	1.100			1.100	1.160	1.100	001-1	1.100	1.100	1.160	1.160	001.1	1.160	1.100	1.100	1.100	1.100	1.100	001-1	1.100	1.100	201.1	1-100
, "3 /"	1.50		85.1	1. 1. 1.									-					5.1	35.1									50. I					5.1				02.1	<u>ي</u>			55.1	85.1					8 5. 1	55.1	85.1	ព ្រំ សូម			85.1			
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dynes umf. U .cp cm cm/s c	602 79.17 6.58 4	602 70.17 5.83 4		894 71.97 12.00	894 71.97 12.02	239 11.70 9.59 220 71 70 0 60	810 70.92 6.38	816 70.92 6.30	817 70.00 5.2	212 /0 00 2 3 /2 70 00 2 3	300 07 12 - 5 - 2 165 69 12 - 5 - 2	894 71.97 4.6	844 71.97 3.6	894 71.97 5.2	694 71,97 5.3	694 71 97 5 4	594 (1.), 47. 47. 5 	103 03.20 00.2 175 50 20 13 2		155 69.20 51.	165 69.20 46.	165 69.20 53.	165 69.20 53.4	165 69.20 61.6	167 69.20 54.4	1 10 11 10 000 0 17 17 10 010	360 67 14 54 4	360 67.14 46.5	360 67.14 40.	360 67.14 40	360 67.14 14	360 67.14 40 100 21 50	100 21 50	160 21.50	100 21.50	100 21.50	100 21.50	100 21.50	100 21.50	100 21.50	100 21.50	100 21.50	100 21.50	100 21.50 9.	100 21.50 7.	100 21.50 8.	100 21.50 7.5	100 21.50 0.14 100 21 50 7 50	100 21.50 7 61 100 21.50 7 61	100 21.50 8.30	100 21 50 6.7	100 21.50 8	100 21 50 13. 100 21 50 13	100 21.50 14	100 21.50 17.	IUU 21.50 Ú
13 μ _g ,Cp cm cm/s c	0 2.602 79.17 6.58 4	0 2.602 70.17 5.83 4 3 4 455 60 13 5.83 4		1 .894 71.97 12.00	1 . 394 71.97 12.02	9 1.239 11.70 9.59 2 1 232 11 20 6 60	1 1.810 70.92 6.38	1 1.816 70.92 6.30	3 2.817 70.00 5.2		1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	1 .84 71.97	1 .844 71.97 3.6	1 .894 71.97 5.2	1 .894 71.97 5.3	1 .834 71.97 5.4		10 4.160 89.28 60.2 2 1 165 50 20 11 2		3 4.165 69.20 51.	3 4.165 69.20 46.	.2 4.165 69.20 53.	.5 4,165 69.20 53.4	3 4.165 69.20 61.6	. 4.165 6%.20 54.4	1 10 111 10 100 111 11 11 1 10 10 10 10 10 10 10		0 12.360 67.14 46.5	0 12.360 67.14 40.	0 12.360 67.14 40	0 12.360 67.14 14	U 12.350 57.14 40		1 1.160 21.50	1 1.100 21.50		0512 0011 1	1 1.100 21.50	1 1.100 21.50	1 1.100 21.50	1 1.100 21.50	1 1.100 21.20	1 1.100 21.50	1 1.100 21.50 9.	1 1.100 21.50 7.					1 1.100 21.50 8.30	1 1.100 21.50 6.7	1 1.100 21.50 8	1 1.100 21.50 13.	1 1.100 21.50 14	1 1.100 21.50 17.	1 1.100 Z1.50 10
^P μ, 3 d <u>ynes</u> Umf, U Kg/m ³ μ _g ,Cp cm cm/s c	1084.0 2.602 70.17 6.58 4	1084.0 2.602 70.17 5.83 4 1113 3 4 155 59 13 5 83 4	1115.5 4.165 55.13 5.67	997.1 .894 71.97 12.00	997.1 . 894 71.97 12.02	1020.9 1.239 71.70 9.59 1020 9 1 239 71 70 6 60	1058.1 1.810 70.92 6.38	1058.1 1.816 70.92 6.30	1089.3 2.817 70.00 5.2	1083.3 2.817 /0.00 5.2 1112 3 4 4/5 /0.10 5.2	1113.3 4.860 67.12 50.2 1113.3 4.165 69.12 5.2	9.1 1.64 21.97 4.6	9.5 1. 1. 294 71.97 3.6	997.1 .894 71.97 5.2	997.1 .694 71.97 5.0 202 - 204 71.97 5.0	4 G 26 12 868 1 266	774.1 (894 71.44 PC 44.9 1113 2 4 148 40 20 42 5	1113.3 4.163 69.28 60.2 1112 2 4 175 50 20 17 5			1113.3 4.165 69.20 46.	1113.3 4.165 69.20 53.	1113.3 4,165 69.20 53.4	1113.3 4.165 69.20 61.6	1113.3 4.165 69.20 54.4	1940 1940 1940 1940 1940 1940 1940 1940	1165.0 12.360 67.14 54.4	1165.0 12.360 67.14 46.5	1165.0 12.360 67.14 40.	1165.0 12.360 67.14 40	1165.0 12.360 67.14 14		785.1 1.100 21.50	735.1 1.100 21.50	785.1 1.100 21.50	705.1 1.100 21.50	785.1 1.100 21.50	785.1 1.100 21.50	785.1 1.100 21.50	785.1 1.100 21.50	785.1 1.100 21.50 705 1 1.100 21.50	785.1 1.160 21.20	785.1 1.100 21.50 7	705.1 1.100 21.50 9.	785.1 1.100 21.50 7.	785.1 1.100 21.50 8. 705 1 1.20 1.70 2.70	765.1 1.100 21.50 7.5	725.1 1.100 21.50 6.74		785.1 1.100 21.50 8.30	785.1 1.100 21.50 6.7	785.1 1.100 21.50 8	785.1 1.100 21.50 13. 785.1 1.100 21 50 13	785.1 1.100 21.50 14	785.1 1.100 21.50 17.	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
^α ,	213.0 1084.0 2.602 70.17 6.58 4	213.0 1084.0 2.602 70.17 5.83 4 213.0 1112 3 4 425 60 13 5 62 5	213.0 1113.3 4.165 69.13 9.67	2e0.0 997.1 .894 71.97 12.00	260.0 997.1 .894 71.97 12.02	400.01020.91.23971.709.59 240.01020.91123971.705.55	260.0 1058.1 1.810 70.92 6.38	260.0 1058.1 1.810 70.92 6.30	200.0 1089.3 2.817 70.00 5.2 200 0 1000 1 2 20 20 20 20	250 0 1112 2 2 817 70,00 5,2 250 0 1112 2 4 125 20 12 5 2	260.0 1113.3 4.165 69.12 59.2 260.0 1113.3 4.165 69.12 5.2	125.0 997.1 .894 71.97 4.6	150.0 597.1 . 294 71.97 3.0	175.0 997.1 .894 71.97 5.2	210.0 397.1 .894 71.97 5.3 200 0 607 : 201 71.97 5.3	-290.0 997.1 .894 71.97 5.4	120.0 220°L 1824 71°27 32°2 120.0 1113 2 4 125 23 20 20 2	100 0 1113.0 4.100 03.20 00.2 100 0 1110 0 4 165 50 50 17 5			140.0 1113.3 4.165 69.20 46.	169.0 1113.3 4.165 69.20 53.	160.0 1113.3 4.165 69.20 53.4	180.0 1113.3 4.165 69.20 61.6	100.0 1113.3 4.163 69.20 54.4	100 100 100 100 100 100 100 100 100 100	140.0 1165.0 12.360 67.14 54.4	140.0 1165.0 12.360 67.14 46.5	160.0 1165.0 12.360 67.14 40.	160.0 1165.0 12.360 67.14 40	150.0 1165.0 12.360 67.14 14		100.0 785.1 1.100 21.20	125.0 735.1 1.100 21.50	125.0 785.1 1.100 21.50	120.0 785.1 1.100 21.50 150 5 705 1 1 100 21.50	150.0 785.1 1.100 21.50	150.0 785.1 1.100 21.50	175.0 785.1 1.100 21.50	175.0 785.1 1.100 21.50	200.0 785.1 1.100 21.50 700 0 705 1 1.100 21.50	20010 785.1 1.100 21.00 100.0 785.1 1.100 21 50	100.0 785.1 1.100 21.50 7	125.0 705.1 1.100 21.50 9.	125.0 785.1 1.100 21.50 7.	163.0 785.1 1.100 21.50 8.	150 0 262 1 1 100 21 20 7.5	1210 2221 1100 2120 0124 1220 2221 1100 2120 0124		200.0 785.1 1.100 21.50 8.30	200.0 785.1 1.100 21.50 6.7	200.0 785.1 1.100 21.50 8	100.0 785.1 1.100 21.50 13. 100.0 785.1 1.100 21 50 15	125.0 785.1 1.100 21.50 14	125.0 785.1 1.100 21.50 17.	1 (80.1 1.100 Z1.50 10
n' ² ε H _a ,mm kg/m ³ μ _a ,cp cm cm/s c	80 .4 213.0 1084.0 2.602 70.17 6.58 4	30 .4 213.0 1084.0 2.602 70.17 5.83 4 30 .4 212 0 1113 2 4 125 60 12 5 50 2	20 4 213.0 1113.3 4.165 69.13 9.27	14 .4	44 .4 260.0 997.1 .894 71.97 12.02	44 .4 200.0 1020.9 1.239 71.70 9.59 44 .4 200.0 1020 9 1 229 71 20 6 60	44 .4 260.0 1058.1 1.810 70.92 6.38	44 .4 260.0 1058.1 1.818 70.92 6.30	44 .4 200.0 1089.3 2.817 70.00 5.2	44 44 200.0 1083.3 2.817 70.00 5.2 44 4 260 0 1112 2 4 145 20 12 5 2	1	17 .4 125.0 997.1 .894 71.97 4.6	34 .4 150.0 597.1 .894 71.57 3.6	51 .4 175.0 997.1 .894 71.97 5.2	00 .4 210.0 997.1 .694 71.97 5.3 06 1 200 0 607 . 001 71 07 5.3	5 14 136 1 AAC. 1 884 71.97 5.4	2°24 (A.17 462° 1°266 0°04 6° 66 6 69 66 69 97 5 6 6111 0 601 5 701	40 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -			32 .4 140.0 1113.3 4.165 69.20 46.	23 .4 160.0 1113.3 4.165 69.20 53.	23 .4 164.0 1113.3 4.165 69.20 53.4	64 .4 180.0 1113.3 4.165 69.20 61.6	04 .4 100.0 1113.5 4.165 69.20 54.4	1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1	27 -4 140.0 1165.0 12.360 67.14 54.4	82 .4 140.0 1165.0 12.360 67.14 46.5	23 .4 160.0 1165.0 12.360 67.14 40.	23 .4 160.0 1165.0 12.360 67.14 40	54 .4 150.0 1165.0 12.360 67.14 14	21 1 100 0 112210 12.350 57.14 40 22 7 100 0 125 1 1 100 21 50	27 .4 100.0 785.1 1.100 21.50	97 .4 125.0 735.1 1.100 21.50	97 .4 125.0 785.1 1.100 21.50	71 14 170 0 785, 1 1,100 21.50 51 14 150 0 795 1 1 1,00 21.50	51 -4 150.0 785.1 1.100 21.50	51 .4 150.0 785.1 1.100 21.50	33 .4 175.0 785.1 1.100 21.50	83 .4 175.0 785.1 1,100 21.50	97 -4 200.0 785.1 1.100 21.50 64 4 700 6 705 1 1.100 21.50	53 .4 100.0 785.1 1.100 21.00 53 .4 100.0 785.1 1.100 21 50	53 .4 100.0 785.1 1.100 21.50 7	54 .4 125.0 765.1 1.100 21.50 9.	54 .4 125.0 785.1 1.100 21.50 7.	24 14 14340 78541 14100 21,50 8. 69 4 150 6 705 1 1 100 21,50 8.	22 - 1 1 1 1 1 2 2 2 1 1 1 1 1 1 2 1 5 2 2 2 2	100 0017001111002 0100111000 100 111000111100011000		41 -4 200.0 785.1 1.100 21.50 8.30	41 .4 200.0 785.1 1.100 21.50 6.7	41 .4 200.0 785.1 1.100 21.50 8	24 -4 100.0 -785.1 1.100 21.50 13. 24 -4 100.0 -785.1 1.100 21 50 13	77 .4 125.0 785.1 1.100 21.50 14	7 -4 125.0 785.1 1.100 21.50 17.	· · · · · · · · · · · · · · · · · · ·
	153.80 .4 213.0 1084.0 2.602 70.17 6.58 4	- 153.80 .4 213.0 1084.0 2.602 70.17 5.83 4 - 153.80 .4 212 0 1112 3 4 145 69 13 5 63 4	153.80 4 213.0 1113.3 1.165 69.13 9.27	179.44 .4 260.0 997.1 .894 71.97 12.00	119.44 .4 260.0 997.1 .894 71.97 12.02	- 1:3:44 .4 0000 1020,9 1.239 71.70 9.59 1 173.44 .4 000.0 1000 0 1 000 11 000 0 00	179.44 .4 260.0 1058.1 1.810 70.92 6.38	174.44 .4 260.0 1058.1 1.810 70.92 6.3	1 179.44 .4 200.0 1089.3 2.817 70.00 5.2	11241414141500001002312 51817 70100 215 1124141 1250001112 2 4 145 50 12 5 5	1120.44 .4 260.0 1113.3 4.166 69.12 m. 2.2	128.17 .4 125.0 997.1 .894 71.97 4.6	256.34 .4 150.0 597.1 .894 71.57 3.6	1 384.51 .4 175.0 997.1 .894 71.97 5.2	1 DILEO 4 210.0 997.1 .894 71.97 5.3 1 240 05 1 250 0 607 1 001 71 07 0 0	1.3 25 12 1837 1.221 1.221 1.32 2.42 1.22 1.122 2.221 1.22	2777 JAILA 4687 - 1924 - 01077 41 66 70 10 10 10 10 10 10 10 10 10 10 10 10 10				1 194.82 .4 140.0 1113.3 4.165 69.20 46.	0 292.23 .4 160.0 1113.3 4.165 69.20 53.	1 292.23 .4 160.0 1113.3 4.165 69.20 53.4	7 223.64 .4 120.0 1113.3 4.165 69.20 51.6 202 1	- 201454 .4 100.0 1113.5 4.165 69.20 54.4	2017 1 2010 2017 2010 2017 2017 2017 201	- 134.82 .4 140.0 1165.0 12.340 67.14 54.4	194.82 .4 140.0 1165.0 12.360 67.14 46.5	1 292.23 .4 160.0 1165.0 12.360 67.14 40.	1 292.23 .4 160.0 1165.0 12.360 67.14 40	- (83.54 .4 180.0 1165.0 12.360 67.14 14 - 202 14 .4 180.0 1165.0 12.360 67.14 14		· 41.27 .4 100.0 785.1 1.100 21.50	1 81.97 .4 125.0 785.1 1.100 21.50	1 81.97 .4 125.0 785.1 1.100 21.50			113.51 .4 150.0 785.1 1.100 21.50	156.83 .4 175.0 785.1 1.100 21.50	156.83.4175.0 725.1 1,100 21.50	- 124459 44 200400 78541 1,100 21,50 1 197469 4 20046 205 4 1 4 400 21,50		1 41.53 .4 100.0 785.1 1.100 21.50 7	76.54 .4 125.0 785.1 1.100 21.50 9.	1 76.54 .4 125.0 785.1 1.100 21.50 7. 1 76 51 .115 6 705 1 1.100 21.50 7.		1 108.69 4 150 0 765 1 1 100 21 50 7.5	1146.73 .4 175.0 726.1 1.100 21.50 6.74		132.41 .4 200.0 785.1 1.100 21.50 8.30	182.41 .4 200.0 785.1 1.100 21.50 6.7	- 182.41 .4 200.0 785.1 1.100 21.50 8 - 41.60 1.00 2 .50	41.82 .4 100.0 785.1 1.100 21.50 13.	73.77 .4 125.0 785.1 1.100 21.50 14	10111 - 155.0 785.1 1.100 21.50 17.	VI 0212 0011 1 100 1 0001 11 100 21 20 10
L,2 P,1,3 d <mark>4, un r, b,1,5 dmf, U</mark> H,am kg/ni ² c H ₂ ,un kg/m ³ u ₂ ,Cp cm cm/s c	113.0 153.80 .4 213.0 1084.0 2.602 70.17 6.58 4	115.0 153.80 4 213.0 1084.0 2.602 70.17 5.83 4 113.0 153.80 4 213.0 113 3 4 256 20 13 5 32 5	113.0 153.80 4 213.0 1113.3 4.165 64.13 5.25	130.0 179.44 .4 260.0 997.1 .894 71.97 12.00	120.0 119.44 .4 260.0 997.1 .894 71.97 12.02	1900, 103444, 4 200,0 1020,9 1,239 71,70 9,59 130,0 173,44 4 240,0 1000 9 1 220 71 70 2 62	130.0 179.44 .4 260.0 1058.1 1.810 70.92 6.38	120.0 179.44 .4 260.0 1058.1 1.810 70.92 6.3	130.0 179.44 .4 250.0 1089.3 2.817 70.00 5.2 130 0 170 41 1 100 0 1000 1 0 012 70 10 0	130.0 1134.44 14 200.0 1023.5 2.817 70.00 215 130.0 179.44 14 200 0 1110 0 1 120 14 15 15 15 15 15	130.0 179.44 .4 260.0 1113.3 4.865 69.12 53.2 130.0 179.44 .4 260.0 1113.3 4.165 69.12 5.2	25.0 128.17 .4 125.0 997.1 .894 71.97 4.6	50.0 256.34 .4 150.0 597.1 .844 71.97 3.6	75.0 %4.51 .4 175.0 997.1 .894 71.97 5.2 110 6 5.2 12 - 515 - 515	110.0 540 05 1 210.0 997.1 . 694 71.97 5.3 110 0 540 05 1 350 0 567	1.2 2.5 2.5 2.5 2.5 2.5 2.5 2.5 2.5 2.5 2	2027 12.12 #480 - 1004 1007 10 2000 100 2004 2007 202 202 202 202 202 202 202 202 20	20.0 97.40 - 1 100 0 1113-0 4.163 07.20 60.20 20.0 97.41 - 1 100 0 1110 0 - 1 105 60 20 20 20 2		40.0 194.52 .4 140.0 1113.3 4.165 69.20 51.	40.0 194.82 .4 140.0 1113.3 4.165 69.20 46.	60.0 292.23 .4 160.0 1113.3 4.165 69.20 53.	60.0 292.23 .4 160.0 1113.5 4.165 69.20 53.	80.0 383.64 .4 180.0 1113.3 4.165 69.20 51.5			40.0 194.82 .4 140.0 1165.0 12.360 67.14 54.4	40.0 134.82 .4 140.0 1165.0 12.360 67.14 45.5	60.0 292.23 .4 160.0 1165.0 12.360 67.14 40.	60.0 292.23 .4 160.0 1165.0 12.360 67.14 40	CULU (C3.64 .4 150.0 1165.0 12.360 67.14 14	22.0 41.22 4 100 0 122.0 12.300 07.14 40 25.0 40 27.14 40	25.4 41.27 .4 100.0 785.1 1.100 21.50	50.0 \$1.97 .4 125.0 735.1 1.100 21.50	50.0 81.97 .4 125.0 785.1 1.100 21.50	75.0 113.51 .4 120.0 705.1 1.100 21.50	75.0 [13.5] .4 150.0 785.1 1.100 21.20	75.0 113.51 .4 150.0 785.1 1.100 21.50	100.0 156.83 .4 175.0 785.1 1.100 21.50	100.0 156.83 .4 175.0 725.1 1,100 21.50	44240 124402 4 20040 78511 1,100 21,50 125.0 197.64 4 700 6 705 4 1,400 21 50	25.0 41.53 .4 100.0 785.1 1.100 21.50	25.0 41.53 .4 100.0 785.1 1.100 21.50 7	50.0 76.54 .4 125.0 785.1 1.100 21.50 9.	20.0 76.54 .4 125.0 785.1 1,100 21,50 7. 50 0 76 51 1155 0 705 1 1,100 21,50 7.	2010 10104 4 12040 785,1 1,100 21,50 8. 75.0 102.69 4 150 0 705 1 1,000 21,50 8.	75.0 108.69 4 150 0 765 1 1.100 21.50 7.5	100.0 146.73 .4 175.0 726.1 1 100 21.50 6.74	100.01145.73 4 175.0 785.1 1.100 21.50 7 51	125.0 182.41 .4 200.0 785.1 1.100 21.50 8.30	125.0 182.41 .4 200.0 785.1 1.100 21.50 6.7	142-0 182.41 .4 200.0 785.1 1.100 21.50 8 15 6 41 66 1 20 2 20 1	25.0 41.89 .4 100.0 785.1 1.100 21.50 13.	50.0 73.77 .4 125.0 785.1 1.100 21.50 14	75.0 107.7 4 125.0 785.1 1.100 21.50 17. 75.0 107.7 4 155.5 765 1 1.10 21.50 17.	
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, L2 P.t., L2 P.t., U is ¥ Dt,mm H,mm Kg/ni ² ε H _s ,iun Kg/m ³ μ _s ,Cp cm cm/s c	11.0 49.8 113.0 153.80 .4 213.0 1084.0 2.602 70.17 6.58 4	2 1.0 49.8 115.0 15.80 .4 213.0 1084.0 2.602 70.17 5.83 4 1 1.0 49.8 113.0 153.80 .4 213.0 1112 2 4 25 60 12 6 26 2		1.0 49.8 130.0 179.44 .4 0.0.0 997.1 .894 71.97 12.00	1 1.0 49.8 130.0 119.44 .4 260.0 997.1 .894 71.97 12.02	- 1.0 47.0 120.0 179.44 14 200.0 1020.9 1.239 71.70 9.59 1 1.0 49.8 130.0 179.44 14 260.0 1020 9 1 229 71 70 2 62	1. 1. 0 49.8 130.0 179.44 .4 260.0 1058.1 1.810 70.92 6.38	1.0 49.5 130.0 179.44 .4 260.0 1058.1 1.810 70.92 6.30	- 1.0 44.8 180.0 179.44 .4 260.0 1089.3 2.817 70.00 5.2 11.6 44 8 180 8 178 41 - 200 8 180 2 2 20 7 20 10 5	1 1 0 10 10 10 10 10 10 11 11 12 10 10 10 10 10 10 10 10 10 10 10 10 10	1 1.0 49.8 130.0 179.44 .4 260.0 1113.3 4.165 69.12 5.2	1 .7 49.8 25.0 128.17 .4 125.0 997.1 .894 71.97 4.6	1 .2 49.8 50.0 256.34 .4 150.0 597.1 .894 71.97 3.6	1 47.8 75.0 284.51 .4 175.0 997.1 . 894 71.97 5.2	· · · · · · · · · · · · · · · · · · ·		1,0 4%,8 20,0 4%,1% 1,000 0,000 0,000 0,000 0,000 0,000 0,000 0,000 0,000 0,000 0,000 0,000 0,000 0,000 0,000 0			11.0 43.8 40.0 134.52 .4 140.0 1112.3 4.155 69.20 51.	0 1.0 49.8 40.0 194.82 .4 140.0 1113.3 4.165 69.20 46.	0 1.0 49.8 60.0 292.23 .4 160.0 1113.3 4.165 69.20 53.	0 1.0 49.0 60.0 292.23 .4 160.0 1113.5 4.165 69.20 53.	2 1.0 47.8 20.0 223.64 .4 120.0 1113.3 4.165 69.20 61.6 21 0 10 2 20 2 20 2 1 1 1 1 1 1 2 2 4.165 69.20 61.6	11.0 42.0 00.0 00.04 14 100.0 1113.5 4.162 69.20 54.4			11.0 49.8 40.0 194.82 .4 148.0 1165.0 12.360 67.14 46.5	0 1.0 49.8 40.0 295.23 .4 160.0 1165.0 12.360 67.14 40.	1 1.0 49.8 60.0 292.23 .4 160.0 1165.0 12.360 67.14 40	2 10 47.0 00.0 201.0 10.0 1105.0 12.360 67.14 14	1 1 0 45.3 25.0 41.22 4 100 0 152.0 12.360 57.14 40 1 1 0 45.3 25.0 41.22 4 100 0 155 1 1 00 0 155 1		11.0 49.8 50.0 51.97 .4 125.0 735.1 1.100 21.50	1.0 49.8 50.0 81.97 4 125.0 785.1 1.100 21.50	110 49.8 75.0 113.51 4 129.0 785.1 1,100 21.50 11.0 49.8 75.0 113.51 4 150 5 795 1 1 100 21.50		11.0 49.3 75.0 113.51 .4 150.0 785.1 1.100 21.50	11.0 49.8 100.0 156.83 .4 175.0 785.1 1.100 21.50	7 1.0 49.3 100.0 156.83 .4 175.0 725.1 1,100 21.50	17.0 40.0 12.00 4 200.0 785.1 1.100 21.50 • 1.8 49.8 125.0 197.60 4 700 6 705 4 4 400 7 50		11.0 45.2 25.0 41.53 4 100.0 725.1 1.100 21.50 7	7 1.0 49.3 50.0 76.54 .4 125.0 785.1 1.100 21.50 9.	7 1.0 49.3 50.0 76.54 .4 125.0 785.1 1.100 21.50 7. 7 1.0 49.8 50 0 76 51 1 155 0 727 5 1 10 21.50 7.	11.0 49.8 75.0 102.63 4 163.0 785.1 1.100 21.50 8. 11.0 49.8 75.0 102.63 4 162 6 366 1 100 21.50 8.				1.0 49.3 125.0 132.41 .4 200.0 785.1 1.100 21.50 8.30		- 1.6 - 43.8 (2).6 (82.4) .4 200.0 285.1 1.100 21.50 8 - 1.6 - 44.8 25 5 - 41 55 - 1.55 5 - 1.55		1.0 49.0 50.0 73.77 .4 125.0 785.1 1.100 21.50 14	1.00 20.0 75.0 107.7 1 25.0 285.1 1,100 21.50 17. 1.0 49.8 75.0 107.71 2 15.0 2 26. 1 20.0 21.50 17.	1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1
^p s, L _a ten H,am Kg/m ² ε H _x ,un Kg/m ³ μ _x ,Cp cm cm/s c	2600 1.0 49.8 113.0 153.80 .4 213.0 1084.0 2.602 70.17 6.58 4		2600 1.0 49.8 113.0 153.80 4 213.0 113.3 4.165 64.13 5.29	2600 1.0 49.8 130.0 179.44 .4 260.0 997.1 .894 71.97 12.00	2000 1.0 49.8 120.0 1.3.44 .4 260.0 997.1 .894 71.97 12.02	2000 1.0 43.0 130.0 173.44 .4 200.0 1020.9 1.239 71.70 9.59 2000 1.0 49.0 130.0 179.44 .4 260.0 1020 0 1 200 71 20 2 62	2600 1.0 49.8 130.0 179.44 .4 260.0 1058.1 1.810 70.92 6.38	2600 1.0 49.8 120.0 179.44 .4 260.0 1058.1 1.810 70.52 6.30		2600 1.0 49.8 120.0 129.44 14 260.0 1023.5 2.817 70.00 5.2 2600 1.0 49.8 120.0 129.44 4 250 0 1112 5 4 145 26 15 5 5	260 1.0 49.8 130.0 179.44 .4 260.0 1113.3 4.165 69.12 7.2.2	10000 .7 49.3 25.0 128.17 .4 125.0 997.1 .894 71.97 4.6	10000 .2 49.8 50.0 256.34 .4 150.0 597.1 .294 71.97 3.6	10000 ./ 49.8 /5.0 %4.51 .4 /75.0 997.1 .894 71.97 5.2 10000 7 46 6 10 6 6 7 7 5 5 7 5 7 5 7 5 7 5 7 5 7	10000 -7 43.8 110.0 21.5 5 4 210.0 397.1 2694 71.97 5.3 10000 -7 49.8 110 6 446 66 1 350 6 667 - 267 5 7 5	10000 7 458 20 0 55 7 1 100 0 20 1 2000 0 2017 1 252 254 27 254	2360 1.0 46° 5.0° 1 66° 13° 1 120 0 1113 2 47° 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5			2900 1.0 49.8 40.0 194.82 4 140.0 1112.3 4.165 69.20 51.	8900 1.0 49.8 40.0 194.82 .4 140.0 1113.3 4.165 69.20 46.	SP00 1.0 49.8 50.0 292.23 .4 160.0 1113.3 4.165 69.20 53.	8700 1.0 49.0 60.0 292.23 .4 160.0 1113.5 4,165 69.20 53.0 8900 1 8 10 1	erun iu 47.8 bu.4 289.64 .4 120.0 1113.3 4.165 69.20 51.5 2900 1 0 10 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	1	2400 1.0 430 20 20 0 20 1 1 100 0 100 100 100 100 1	8200 L.0 49.8 40.0 194.82 4 140.0 1165.0 12.360 67.14 54.4	8200 L.U 49.8 40.0 134.82 .4 140.0 1165.0 12.360 67.14 46.5	3900 1.0 49.8 60.0 292.23 .4 160.0 1165.0 12, 360 67.14 40.	5740 1.0 49.0 60.0 292.23 .4 160.0 1165.0 12.360 67.14 40	2400 10 47.0 20.0 (37.54 ,4 120.0 1165.0 12.360 67.14 14 2400 1 0 42 0 00 0 100 1 1 100 1 1 10	2600 1.0 49.8 25.0 41.22 4 100 0 1021 1 10220 57.14 40	2600 1.0 49.3 25.0 41.27 4 100.0 785.1 1.100 2150	2600 1.0 49.8 50.0 81.97 .4 125.0 735.1 1.100 21.50	-24 UV 1.0 49.8 50.0 81.97 4 125.0 785.1 1.100 21.50	2600 1.0 49.8 75.0 11.51 .4 125.0 785.1 1.100 21.50	2600 1.0 49.8 75.0 113.51 .4 150.0 785.1 1.100 21.50	2600 1.0 49.3 75.0 113.51 .4 150.0 785.1 1.100 21.50	2600 1.0 49.3 100.0 156.33 .4 175.0 785.1 1.100 21.50	2000 1.0 47.3 100.0 156.33 .4 175.0 725.1 1,100 21.50 2600 1 0 49 0 15 0 101 0 101 0 101 0	2000 1.0 49.8 125.0 127.69 4 200.0 785.1 1.100 21.50 2000 1.0 49.8 125.0 127.69 4 200.0 705 1 1.00 21.50	2600 1.0 49.8 25.0 41.53 .4 100.0 285.1 1.100 21.50	2600 1.0 45.3 25.0 41.53 4 100.0 725.1 1.100 21.50 7	Zevu 1.0 49.3 50.0 76.54 .4 125.0 765.1 1.100 21.50 9.		2001.0 49.8 75.0 102.63 4 163.0 785.1 1,100 21,50 8.			2600 1.0 49.8 100.0 145.73 4 175.0 785.1 1.100 21.50 7 61	2600 1.0 49.3 125.0 132.41 .4 200.0 785.1 1.100 21.50 8.30	2600 1.0 49.8 125.9 182.41 .4 200.0 785.1 1.100 21.50 6.7	2000 1.0 43.3 1.25.0 182.41 .4 200.0 785.1 1.100 21.50 8 2600 1.0 44.8 15 6 41 55 1.55 255 255	2600 1.0 49.3 25.0 41.89 4 100.0 785.1 1.100 21.50 13	2000 1.0 49.0 50.0 73.77 .4 125.0 785.1 1.100 21.50 14	2600 1.0 49.8 75.0 107.7 4 125.0 785.1 1.100 21.50 17.	0 05112 00111 11020 00001 11 1100 510 000 10
^P s, ^C s, ^C s, ^C s, ^C s, ^C s, ^P s, ^C s,	328.0 2600 1.0 49.8 113.0 153.80 .4 213.0 1084.0 2.602 70.17 6.58 4	328.0 2600 1.0 49.8 115.0 155.80 4 213.0 1084.0 2.602 70.17 5.83 4 328.0 2600 1.0 49.8 113.0 153.80 1 212 0 113 2 4 225 22 22 22 22 22	328.0 2600 1.0 49.8 113.0 153.80 4 213.0 113.7 4 166 69 13 6 26	328.0 2600 1.0 49.3 130.0 179.44 .4 260.0 997.1 .894 71.97 12.00	323.0 2000 1.0 49.8 130.0 1/9.44 .4 260.0 997.1 .894 71.97 12.02 236 A 2000 1 A 10 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	328.0 2000 1.0 49.0 130.0 179.44 14 200.0 1020.9 1.239 71.70 9.59 328.0 2000 1.0 49.0 130.0 179.44 14 200.0 1000 0 1 200 2 60	325.0 2600 1.0 49.8 130.0 179.44 .4 260.0 1058.1 1.810 70.92 6.38	328.0 2600 1.0 49.4 130.0 179.44 .4 260.0 1058.1 1.816 70.52 6.30	acou zouriu 44.8 130.0 179.44 4 260.0 1389.3 2.817 70.00 5.2 328.0 2600 1.0 49 2 130 0 172 4 1 1 100 0 100 1 2 1 1 1 1 1 1 1 1 1 1 1	323.0 2600 1.0 49.8 120.0 124.44 4 260.0 1023.5 2.817 70.00 5.2 323.0 2600 1.0 49.8 120.0 124.44 4 260.0 0112 5 4 766 26 12 5 5	328.0 2600 1.0 49.8 130.0 179.44 .4 260.0 1113.3 4.165 69.12 5.2	11.0 10000 .7 49.3 25.0 128.17 .4 125.0 997.1 .894 71.97 4.6	11.0 10000 .2 49.8 50.0 256.34 .4 150.0 597.1 .894 71.97 3.6	11.0 1000 ./ 49.8 /5.0 %4.51 .4 /75.0 997.1 .894 71.97 5.2 11.0 10000 7 45 11.5 21.2 2 2 2	11.0 10000 7 43.0 110.0 312.63 4 210.0 397.1 2694 71.97 5.3		311.0 3900 1.0 49.8 20.0 49.12 1.00 0.111 2.42.5	311.0 5700 1.0 49.8 20.0 47.40 4 100 0 111.0 4 125 20 20.20 211.0 5700 1.0 49.8 20.0 47.41 4 100 0 111 0 4 125 20 10 10 10	311.0 SP00 1.0 49.8 20.0 9.74 1.120 1.11 2.20 1.0 1.120 2.10 1.12 2.20 2.20	311-0 2900 1.0 49.8 40.0 194.82 4 140.0 1113.3 4.165 69.20 51.	311.0 8900 1.0 49.8 40.0 194.82 .4 140.0 1113.3 4.165 69.20 46.	211.0 STUD 1.0 49.8 60.0 232.23 .4 160.0 1113.3 4.165 69.20 53.	JULY STVU 1.0 49.0 60.0 292.23 .4 160.0 1115.5 4,165 69.20 53.				311.0 8200 1.0 49.8 40.0 194.82 4 140.0 1165.0 12.360 67.14 54.4	311.0 8200 1.0 49.8 40.0 134.82 .4 140.0 1165.0 12.360 67.14 46.8	311.0 8900 1.0 49.8 40.0 292.23 .4 160.0 1165.0 12.360 67.14 40.	311.0 STAU 1.0 49.8 50.0 292.23 4 150.0 1155.0 12.350 57.14 40	311.0 2500 10 47.0 20.0 23.54 4 120.0 1165.0 12.360 67.14 14 311.0 2500 1 0 42 0 00 6 500 7 1 1 00 1 1 1 1		180.0 2600 1.0 49.3 25.0 41.27 4 100.0 785.1 1.100 2150	180.0 2600 1.0 49.8 50.0 51.97 .4 125.0 735.1 1.100 21.50	180.0 - 2400 1.0 - 49.8 - 50.0 - 51.97 - 4 125.0 - 765.1 - 1.100 - 21.50 120.0 - 2200 1.0 - 12 - 12 - 12 - 12 - 12 - 12 - 12 - 1	120-0 2600 1.0 49.5 75.0 117.51 J 150 0 205.1 1.100 21.50	180.0 2600 1.0 49.8 75.0 113.51 .4 150.0 785.1 1.100 21.50	180.0 2000 1.0 49.3 75.0 113.51 .4 150.0 785.1 1.100 21.50	139.0 2600 1.0 49.3 100.0 156.33 .4 175.0 735.1 1.100 21.50	100.0 2600 1.0 43.3 100.0 156.63 .4 175.0 725.1 1.100 21.50 120.0 2600 1 0 44 0 125 0 107 20 115.0 225.1	180.0 2600 1.0 49.3 125.0 197.63 1 200.0 725.1 1,100 21.50	255.0 2600 1.0 49.8 25.0 41.53 .4 100.0 285.1 1.100 21.50	255.0 2600 1.0 45.8 25.0 41.53 4 100.0 785.1 1.100 21.50 7	ZODIE ZEUU 1.0 49.3 50.0 76.54 .4 125.0 765.1 1.100 21.50 9.	2000 2000 10 49/3 50.0 70.54 44 125.0 785.1 1,100 21.50 7. 255.0 2600 1.0 49.2 50 6 70 51 51 10 20 10 21.50 7.	255.0 2600 1.0 49.8 75.0 102.63 J 160 0 765.1 1.100 21.50 8.	255.0 2600 1.0 49.3 75.0 108.69 J 150.0 755 1 1.100 21.50 7.5	255.0 2600 1.0 49.6 100.0 146.73 .4 175.0 285.1 1 100 21.50 6.74	255.0 2600 1.0 49.8 100.0145.73 4 175.0 785.1 1.100 21.50 7 4	255.0 2600 1.0 49.3 125.0 182.41 .4 200.0 785.1 1.100 21.50 8.30	255.0 2600 1.0 49.8 125.0 182.41 .4 200.0 785.1 1.100 21.50 6.7	290.0 2600 1.0 44.8 125.0 182.41 .4 200.0 785.1 1.100 21.50 8 390.0 2600 1.0 44.8 15 5 41 55 1.55 1.55 1.55	390.0 26001.0 49.2 25.0 41.89 4 100.0 785.1 1.100 21.50 13	330.0 2000 1.0 49.0 50.0 73.77 4 125.0 785.1 1.100 21.50 14	390.0 2600 1.0 49.8 75.0 107.71 4 125.0 785.1 1,100 21.50 17.	1. 100 21:20 10 100 100 100 100 21:20 10

U _{st} . cm/s	116.00 16.00
Umf' cm/s	22.55 25.55
dynes Gilles	88989888888888888888888888888888888888
µ,,Cp	
ρ.,3 Kg/m ³	78551 78551 78551 78551 78551 78551 78551 78551
H, mm	75.0 125.0 125.0 125.0 125.0 125.0 125.0 125.0 125.0 125.0 125.0 125.0 125.0 125.0
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L.2 Kg/m ²	4 4 4 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5
H,nm	25.0 25.0 25.0 25.0 25.0 25.0 25.0 25.0
Dt,mn	
Ps, Kg/ms	2600 2600 2600 2600 2600 2600 2600 2600
	644.5 644.5 644.5 644.5 644.5 644.5 644.5 644.5 644.5 644.5 644.5 644.5 644.5 644.5 644.5 645.5 64
Test No.	9 7 6 1 N 7 7 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9
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