

**TABLE 18.1**  
**Characteristics of dumped tower packings**<sup>12,15b,27</sup>

Type	Material	Nominal size, in.	Bulk density, <sup>†</sup> lb/ft <sup>3</sup>	Total area, <sup>†</sup> ft <sup>2</sup> /ft <sup>3</sup>	Porosity $\epsilon$	Packing factors <sup>‡</sup>	
						$F_p$	$f_p$
Raschig rings	Ceramic	$\frac{1}{2}$	55	112	0.64	580	1.52§
		1	42	58	0.74	155	1.36§
		$1\frac{1}{2}$	43	37	0.73	95	1.0
		2	41	28	0.74	65	0.92§
Pall rings	Metal	1	30	63	0.94	56	1.54
		$1\frac{1}{2}$	24	39	0.95	40	1.36
		2	22	31	0.96	27	1.09
	Plastic	1	5.5	63	0.90	55	1.36
		$1\frac{1}{2}$	4.8	39	0.91	40	1.18
Berl saddles	Ceramic	$\frac{1}{2}$	54	142	0.62	240	1.58§
		1	45	76	0.68	110	1.36§
		$1\frac{1}{2}$	40	46	0.71	65	1.07§
Intalox saddles	Ceramic	$\frac{1}{2}$	46	190	0.71	200	2.27
		1	42	78	0.73	92	1.54
		$1\frac{1}{2}$	39	59	0.76	52	1.18
		2	38	36	0.76	40	1.0
		3	36	28	0.79	22	0.64
Super Intalox saddles	Ceramic	1	—	—	—	60	1.54
		2	—	—	—	30	1.0
IMTP	Metal	1	—	—	0.97	41	1.74
		$1\frac{1}{2}$	—	—	0.98	24	1.37
		2	—	—	0.98	18	1.19
Hy-Pak	Metal	1	19	54	0.96	45	1.54
		$1\frac{1}{2}$	—	—	—	29	1.36
		2	14	29	0.97	26	1.09
Tri-Pac	Plastic	1	6.2	85	0.90	28	—
		2	4.2	48	0.93	16	—

<sup>†</sup>Bulk density and total area are given per unit volume of column.

<sup>‡</sup>Factor  $F_p$  is a pressure drop factor and  $f_p$  a relative mass-transfer coefficient. Factor  $f_p$  is discussed on page 603 in the paragraph "Performance of Other Packings." Its use is illustrated in Example 18.7.

<sup>§</sup>Based on  $\text{NH}_3\text{-H}_2\text{O}$  data; other factors based on  $\text{CO}_2\text{-NaOH}$  data.