

TYPICAL APPLICATIONS FOR RANDOM PACKINGS

Ceramic Random Packings [Saddles, Super Saddles, Raschig Rings, Pall Rings]

- Manufacture and handling of sulfuric acid
- Chlorine Drying Towers
- Nitric Acid Concentrators
- HCL Stripping
- Phosphoric Acid Scrubbing
- Thermal Oxidation [Incineration]

Thermoplastic Random Packings [Super Saddles, Pall Rings]

- SO₂, HCL and HF Absorption or Stripping
- CL₂ Absorption [in water or caustic]
- Chlorine Dioxide Absorption
- Air Pollution Control [Ex. Packed Tower scrubber for the removal of noxious odors]
- Water and Groundwater Treatment [VOC removal, degassing (ex. Removal of CO₂)]
- Heat Transfer [humidifaction/dehumidification]
- Biological Growth Media [wastewater treatment and aquaculture applications]

Metal Random Packings [Raschig Rings, Pall Rings, IMTP Equivalent]

- CO₂ and H₂S selective absorption
- Air Pollution Control
- Ammonia Absorption
- FCC Absorbers
- Sour Water Strippers
- EO/EG Strippers
- Heat Transfer
- Quench Columns
- Light Ends Fractionators [Demethanizers/Deethanizers]
- Degassing
- Liquid/Liquid Extraction

Christy[®] Pak Ceramic Raschig Rings

FEATURES

- ▶ High mechanical strength
- ▶ Economical
- ▶ High available surface area
- ▶ Well-proven in thousands of installations worldwide



PACKING DATA

OD	Density	Surface Area	Free Space	Wall Thickness
(mm)	(kg/m ³)	(m ² /m ³)	(%)	(mm)
6	890	930	58	2.0
10	850	440	65	2.0
15	690	320	70	2.0
25	580	190	72	2.5
35	580	150	76	4.0
50	530	95	77	5.0
80	535	65	78	9.5
100	520	60	80	10.0

Christy Catalytics, LLC offers a complete range of catalyst bed supports, tower packings and tower internals.

Christy[®] Pak Metal Raschig Rings

FEATURES

- Available in a wide range of sizes, thicknesses and metallurgies
- High mechanical strength
- Economical
- High available surface area
- Well-proven in thousands of installations worldwide



PACKING DATA

Nominal OD	*Density	Surface Area	Free Space
(mm)	(kg/m ³)	(m ² /m ³)	(%)
19	833	350	92
25	625	220	93
35	400	150	96
50	592	110	97
80	400	65	98

* Density is based on 304SS and the following thicknesses: 19mm, 25mm and 35mm - 0.8mm, 50mm and 80mm - 1.6mm.
Other sizes and wall thicknesses are available upon request.

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Christy[®] Pak Carbon Raschig Rings

FEATURES

- Resistant to a wide range of acids, alkalis and solvents
- High resistance to thermal shock
- High thermal conductivity
- Available in a variety of sizes
- High mechanical strength
- Fully carbonized – no extractable impurities



PACKING DATA

Nominal OD	Density	Surface Area	Free Space	Wall Thickness
(mm)	(kg/m ³)	(m ² /m ³)	(%)	(mm)
13	474	384	71	1.75
19	602	219	61	4.24
25	563	163	62	5.46
38	493	128	67	6.17
51	438	94	71	7.14
76	333	56	78	8.63

Christy Catalytics, LLC offers a complete range of catalyst bed supports, tower packings and tower internals.

Christy[®] Pak Ceramic Saddles

FEATURES

- ▶ High mechanical strength
- ▶ Economical
- ▶ High available surface area
- ▶ Well-proven in thousands of installations worldwide



TYPICAL CHEMICAL ANALYSIS (WT.%)

Alumina, Al ₂ O ₃	17.0 – 23.0
Silica, SiO ₂	72.0 – 76.0
Calcia, CaO	< 0.5
Iron Oxide, Fe ₂ O ₃	< 0.9
Alkalies, K ₂ O + Na ₂ O	3.0 – 4.0
Magnesia, MgO	< 0.5
Other	< 0.1

TYPICAL PHYSICAL PROPERTIES

Specific Gravity, g/cc	2.3
Water Absorption, Wt. %	< 0.3
Mohs Hardness	> 6.5
Maximum Use Temperature, C	1100
Thermal Conductivity, W/m-K	0.9 – 1.0

PACKING PROPERTIES

Nominal Size	1/2"	3/4"	1"	1-1/2"	2"	3"
Packing Density, kg/m ³	778	692	616	583	528	459
Free Volume, %	66	72	74	77	78	80
Surface Area, m ² /m ³	540	338	250	164	142	62

Christy Catalytics, LLC offers a complete range of catalyst bed supports, tower packings and tower internals.

Christy® Pak Arch Saddles

FEATURES

- Available in a wide range of sizes, thicknesses and metallurgies
- High mechanical strength
- Economical
- High available surface area
- Well-proven in thousands of installations worldwide
- Higher hydraulic capacity than first generation metal random packings



PACKING DATA

Size	Thickness	*Density	Surface Area	Free Space
	(mm)	(kg/m ³)	(m ² /m ³)	(%)
15	0.25	280	305	96.5
25	0.30	255	241	96.8
40	0.40	231	161	97.1
50	0.40	149	104	98.1
60	0.40	142	85	98.2
70	0.50	113	62	98.6

*Density is based on 304SS.

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Christy[®] Pak Metal Pall Rings

FEATURES

- Available in a wide range of sizes, thicknesses and metallurgies
- High mechanical strength
- Economical
- High available surface area
- Well-proven in thousands of installations worldwide
- Higher hydraulic capacity than first generation metal random packings



PACKING DATA

Nominal OD	*Density	Surface Area	Free Space
(mm)	(kg/m ³)	(m ² /m ³)	(%)
15	385	360	95
25	231	215	95
38	207	135	96
50	200	105	97
80	200	80	98

* Density is based on 304SS and the following thicknesses: 15mm and 25mm - 0.3mm, 38mm - 0.4mm, 50mm - 0.5mm and 80mm - 0.8mm. Other wall thicknesses are available upon request.

Christy Catalytics, LLC offers a complete range of catalyst bed supports, tower packings and tower internals.

Christy[®] Pak Plastic Pall Rings

FEATURES

- Available in a wide range of sizes and thermoplastic materials
- High mechanical strength
- Economical
- High available surface area
- Well-proven in thousands of installations worldwide



PACKING DATA

OD	Density	Surface Area	Free Space	Wall Thickness
(mm)	(kg/m ³)	(m ² /m ³)	(%)	(mm)
16	141	260	91	1.00
25	82	210	90	1.20
38	54	140	89	1.40
51	51	100	90	1.50
76	58	73	92	2.60

Christy Catalytics, LLC offers a complete range of catalyst bed supports, tower packings and tower internals.

Christy[®] Fill Honeycomb | Alumina Mullite

FEATURES

- High mechanical strength at high temperatures
- High available surface area
- Excellent thermal shock resistance

PHYSICAL PROPERTIES

Bulk Density, g/cm ³	2.5 – 2.9
Average Linear Expansion, 10 ⁻⁶ /K	6.0 Max.
Specific Heat, kJ/kg-C	1100 – 1300
Maximum Application Temperature, C	1450
Thermal Conductivity, W/m-K	1.5 – 2.3
Softening Temperature, C	1450
Acid Resistance, %	99.0 Min.



CHEMICAL ANALYSIS (WT.%)

Al ₂ O ₃	45.0 – 75.0
SiO ₂	20.0 – 50.0
Fe ₂ O ₃	1.0 Max.
MgO	0.2 Max.
TiO ₂	2.5 Max.
K ₂ O + Na ₂ O + CaO	0.5 Max.

DIMENSIONS AND OTHER PHYSICAL PROPERTIES

Dimension (mm)	Number of Channels	Wall Thickness (mm)	Channel Width (mm)	Surface Area (m ² /m ³)	Free Space (%)	Packing Density (kg/m ³)
150x150x300	25x25	1.0	4.96	580	68	770
150x150x300	32x32	1.0	3.66	695	61	829
150x150x300	40x40	0.7	3.03	891	65	888
150x150x300	43x43	0.7	2.77	940	63	932
150x150x300	50x50	0.6	2.39	1090	63	977
150x150x300	60x60	0.5	1.99	1303	63	1006

Christy Catalytics, LLC offers a complete range of catalyst bed supports, tower packings and tower internals.

THE ABOVE DATA ARE BASED ON CONTROLLED TESTING. INDIVIDUAL TEST RESULTS MAY VARY; THEREFORE THESE DATA MAY NOT BE USED FOR SPECIFICATION PURPOSES.

NO WARRANTIES, EXPRESS OR IMPLIED, INCLUDING WARRANTIES OF FITNESS FOR A PARTICULAR PURPOSE OR MERCHANTABILITY, ARE MADE REGARDING THE DATA OR PRODUCTS SHOWN ABOVE.

Revised: August 25, 2010

Christy® Fill Honeycomb | Dense Cordierite

FEATURES

- High mechanical strength at high temperatures
- High available surface area
- Excellent thermal shock resistance



PHYSICAL PROPERTIES

Bulk Density, g/cm ³	2.2 – 2.5
Average Linear Expansion, 10 ⁻⁶ /K	< 3.5
Specific Heat, kJ/kg-C	800 – 1200
Maximum Application Temperature, C	1250
Thermal Conductivity, W/m-K	1.7 – 2.0
Softening Temperature, C	1250
Acid Resistance, %	> 95.0

CHEMICAL ANALYSIS (WT.%)

Al ₂ O ₃	28.0 – 34.0
SiO ₂	50.0 – 54.0
Fe ₂ O ₃	> 1.0
MgO	6.0 – 8.0
TiO ₂	< 1.0
K ₂ O + Na ₂ O + CaO	3.0 – 3.3

DIMENSIONS AND OTHER PHYSICAL PROPERTIES

Dimension (mm)	Quantity of Channels	Wall Thickness (mm)	Channel Width (mm)	Surface Area (m ² /m ³)	Free Space (%)	Packing Density (kg/m ³)	Weight Per Piece (kg)
150x150x300	25x25	1.0	4.96	580	68	710	4.80
150x150x300	32x32	1.0	3.66	695	61	755	5.10
150x150x300	40x40	0.7	3.03	891	65	814	5.50
150x150x300	43x43	0.7	2.77	940	63	821	5.55
150x150x300	50x50	0.6	2.39	1090	63	866	5.85
150x150x300	60x60	0.5	1.99	1303	63	888	6.00

Christy Catalytics, LLC offers a complete range of catalyst bed supports, tower packings and tower internals.

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Revised: August 25, 2010

Christy® Fill Mullite Saddles

FEATURES

- ▶ High mechanical strength
- ▶ Economical
- ▶ High available surface area
- ▶ High application temperature



TYPICAL CHEMICAL ANALYSIS (WT.%)

Alumina, Al ₂ O ₃	70.0 – 73.0
Silica, SiO ₂	20.0 – 23.0
Calcia, CaO	< 0.5
Iron Oxide, Fe ₂ O ₃	< 0.9
Alkalies, K ₂ O + Na ₂ O	< 4.0

TYPICAL PHYSICAL PROPERTIES

Specific Gravity, g/cc	3.0
Water Absorption, Wt. %	< 2.5
Maximum Use Temperature, C	1450

PACKING PROPERTIES

Nominal Size	1/2"	3/4"	1"	1-1/2"	2"	3"
Packing Density, kg/m ³	1015	903	803	760	689	599
Free Volume, %	66	72	74	77	78	80
Surface Area, m ² /m ³	540	338	250	164	142	62

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