

# SHR

## FLOATING-HEAD HEAT EXCHANGER

### 浮头式换热器

One end of the tube plates on both ends of the floating-head heat exchanger is not connected to the shell, and that end is called the floating head. When tubes are heated, the tube bundle along with the floating head can extend or retract in the axial direction, thus removing the temperature stress completely.

The new floating-head heat exchanger's floating head end structure consists of such parts as cylinder, outer cover side flange, floating tube plate, hook, floating head, outer cover, thread hole and steel ring.

#### Characteristics of floating-head heat exchanger:

One end of tube plates of the floating-head heat exchanger is fixed between the shell and the tube box while the other end can move freely inside the shell. That characteristic can be seen on the site. As for this heat exchanger type, the thermal expansion of its shell and tube bundle is free, and its tube bundle can be drawn out to facilitate cleaning between and inside tubes. Its defects include complex structure, high

cost (20% higher than that of the fixed tube plate), the floating head's vulnerability to leakage during running and inconvenience in check and troubleshooting. It's suitable for such conditions as big temperature difference between shell and tube bundle, or the shell pass medium being vulnerable to scaling.

The floating-head heat exchanger is widely applied for such occasions as serious scaling and tube pass being vulnerable to corrosion in chemical and petroleum refining units by right of its advantages like being easy for cleaning tube and shell pass, no restrictions on temperature difference between media, and being able to work under high temperature and pressure (generally temperature  $\leq 450^{\circ}\text{C}$  and pressure  $\leq 6.4\text{MPa}$ ). The floating-head heat exchanger and the condenser have formed standard series. The heat exchanger is divided into two kinds: internal diversion and external diversion.

浮头式换热器两端的管板，一端不与壳体相连，该端称浮头。管子受热时，管束连同浮头可以沿轴向自由伸缩，完全消除了温差应力。

新型浮头式换热器浮头端结构，它包括圆筒、外头盖侧法兰、浮头管板、钩圈、浮头盖、外头盖及丝孔、钢圈等组成，

#### 浮头换热器的特点：

浮头式换热器的一端管板固定在壳体与管箱之间，另一端管板可以在壳体内自由移动，这个特点在现场能看出来。这种换热器壳体和管束的热膨胀是自由的，管束可以抽出，便于清洗管间和管内。其缺点是结构复杂，造价高（比固定管板高20%），在运行中浮头处发生泄漏，不易检查处理。浮头式换热器适用于壳体和管束温差较大或壳程介质易结垢的条件。

浮头式换热器因其管、壳程清洗方便，介质间温差不受限制，可在高温、高压下工作（一般温度  $\leq 450^{\circ}\text{C}$ ，压力  $\leq 6.4\text{MPa}$ ）等优点而大量用于化工、石油炼制装置中结垢比较严重、管程易腐蚀的场合。浮头式换热器和冷凝器已形成标准系列，换热器分内导流和外导流两种。



#### 技术参数 Technology parameter

公称直径 DN mm	管程数 N	管子根数 n		公称换热面积 $\text{Am}^2$							
		管子外径 d mm		换热管长度							
		19	25	L=3m		L=4.5m		L=6m		L=9m	
325	2	60	32	10	5	15	10	-	-	-	-
	4	52	28	10	5	15	10	-	-	-	-
400	2	120	74	20	15	30	25	40	35	-	-
	4	108	68	20	15	30	25	40	30	-	-
500	2	206	124	35	30	55	45	70	55	-	-
	4	192	116	35	25	50	40	70	55	-	-
600	2	324	198	55	45	85	70	115	90	-	-
	4	308	188	55	45	80	65	110	85	-	-
	6	284	158	50	35	75	55	100	75	-	-
700	2	468	268	80	60	120	90	165	125	-	-
	4	448	256	75	60	115	90	155	120	-	-
	6	382	224	65	50	100	75	135	105	-	-
800	2	610	366	-	-	160	125	215	170	-	-
	4	588	352	-	-	155	120	205	160	-	-
	6	518	316	-	-	135	110	180	145	-	-