公司简介 *Company*

天津市恒庆机械有限公司自 1981 年开始生产浮动油封，是目前国内规模最大的设计制造浮动油封的专业企业，其生产规模、产品品种、型号、市场占有率均为中国之最。

恒庆公司的工程师们拥有 30 多年的设计和研发经验，使用当代最先进的设计工具和检测设备为客户设计提供样件、生产测试和安装指导。自主研发材料，拥有一流的制造设备和试验检测设备，为顾客提供优质的产品和服务，产品多年来为国内外各大主机企业配套。

建立企业与客户在产品、质量、信誉等多方面的沟通，支持与了解。我们坚信，只有在为用户提供优质、满意的产品、完善的售后服务及全面有效的市场保护，才能最终得到用户的高度信赖，只有这种信赖才能建立起“恒庆”与客户之间的永恒桥梁。

Since 1981,Tianjin HengQing Machinery Company Limited has been designing, manufacturing and distributing floating seals for its customers for whom quality is a determining factor.Now it is an active company specializing in inventing,designing,and producing floating seal.Since the yearly output of main products,quality,scale,types,models and market share all rank highly in China.

Its engineers have 30 years of design and development experience,using the most advanced design tools and test equipments designing for the clients to provide samples, production test and installation guide. Independent research and development materials, have first-class manufacturing equipments and testing equipment, to provide customers with quality products and services, and products for many years for the domestic and foreign enterprises,and won good reputation.

Support and understanding between the company and customers in various fields such as product,quality,reputation and etc,we strongly believe that we can finally be trusted by users only after providing the users with quality satisfactory products ,perfect service and effctive overall market protection.The everlasting bridge between "HENG QING"and customers can only be built by this trust.











质量管理及方法 *Quality Management and Methods*

我们工作的标准是我们的质量准则：

Our work is guided by quality principles

1. 我们的目标是从产品质量和服务上全面满足客户的要求；
   Our goal is to fully satisfy our customers' expectation through the quality of our products and services.
2. 质量和质量的提高应是每位员工的职责和目标---从公司管理层到每一个员工；
   Quality and quality improvement are every staff's responsibility and ultimate goal-from the top management to every staff.
3. 我们的工作方向、工作程序、体系及目标是根据国际标准、顾客期望值和我们的行业知识和经验制定的。我们质量的基础建立在对工作方向和工作体制的了解和执行。
   Our directives,processes,systems and goals are based on requirements from international standards,customer expectations,our knowledge and processes while the foundation of our quality is built on the familarity an carryout of the directives and systems.
4. 质量意味着从一开始就把事情做好，从而防止结果的失败。工作程序质量的提高能降低成本，提高生产效率；
   Quality means doing things right from the beginning, thus preventing failures in the end.Continuous improvement of the quality of processes lowers costs and increases productivity.
5. 防范比改正缺陷更重要。我们不断地提供工具及防范来保证质量。从错误中吸取经验，从一开始就找到错误的根源并杜绝它的发生；
   Avoiding failures is more important than correcting .We systematically apply methods and tools for preventive quality assurance,learn from mistakes and eliminate their root causes without delay.
6. 供应商从很大程度上影响产品质量和服务水平，因此我们的供应商必须达到我们所要求的高标准。
   Our suppliers contribute substantially to the quality of our products and services .Therefore,our suppliers must live up to the same high quality standards we have adopted.


国家重点新产品
证书
项目名称：一次成型合金铸铁旋转密封件
项目编号：2008GRA10006
承担单位：天津市恒庆机械有限公司
发证时间：二〇〇八年十一月
有效期：三年
批准机关：科学技术部


高新技术企业
证书
企业名称：天津市恒庆机械有限公司
证书编号：GF201112000027
发证时间：2011年10月8日
有效期：三年
批准机关：


SHANTUI
质量优胜供应商
（二〇〇九年度）
山推工程机械股份有限公司履带底盘分公司
TRACK-TYPE UNDERCARRIAGE BRANCH COMPAN OF SHANTUI

概述 *Generalities*

产品描述 *Product Description*

- 浮动油封寿命长，分为双锥面油封、双球面油封和重载型油封。
- Floating seal also known under lifetime seal, duo cone seal, toric seal or heavy duty seal.
- 由两个金属环和两个 O 型橡胶圈组成。
- Composed of 2 metallic seal rings and 2 specific molded parts in rubber.
- 面对面安装在浮封座腔内。
- Mounted in separate housing face to face.
- 受到橡胶圈的轴向力使浮封环在座腔内保持良好的贴合。
- Seal centered in the housing thanks to the 2 rubber parts.

产品优势 *Product Advantages*

- 适用于污染、水、粉尘、油污等极端恶劣工况环境。
- Suitable with pollution, water and abrasive elements from the outside and against oil and grease from the inside.
- 寿命长，可达 5000 小时以上。
- Long service life.
- 端面磨损自动补偿。
- Self-centering to compensate for shaft eccentricity or misalignment.
- 安装简单。
- Ease of assembly.

产品应用 *Product Applications*

- 履带式车辆，如挖掘机、推土机。
- Tracked vehicles, such as excavators and bulldozers
- 矿山机械
- Mining machines
- 汽车
- Trucks
- 农业机械
- Agriculture machines
- ……



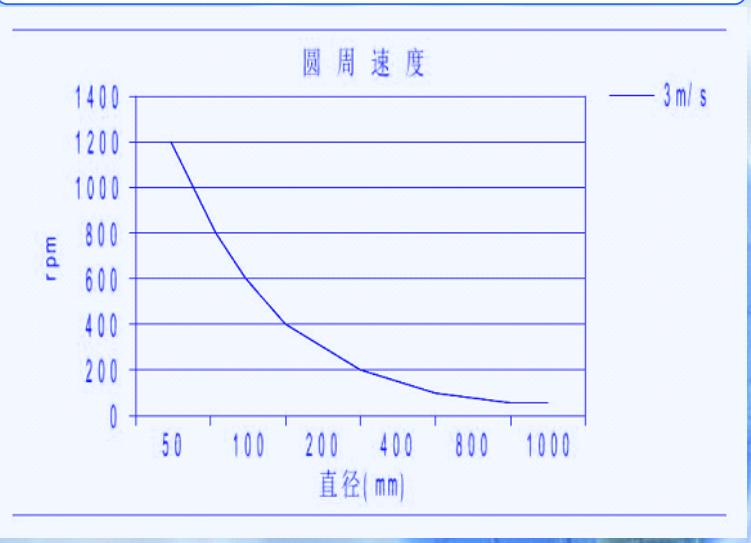




技术指导 *Technical guidance*

技术数据 *Technical Data*

速度 Speed



金属环材料 Seal Material

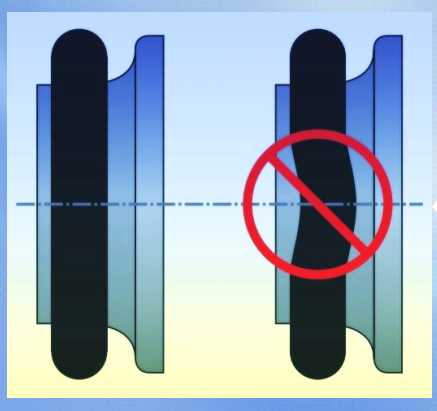
材料 Material%	合金铸铁 Alloy Cast Iron
C	2.80-3.90
Si	＜1.60
Mn	0.30-1.00
P	＜0.06
S	＜0.06
Cr	14.00-18.00
Mo	2.00-4.00
Ni	————
Fe	其余 others

橡胶件材料 Rubber Material

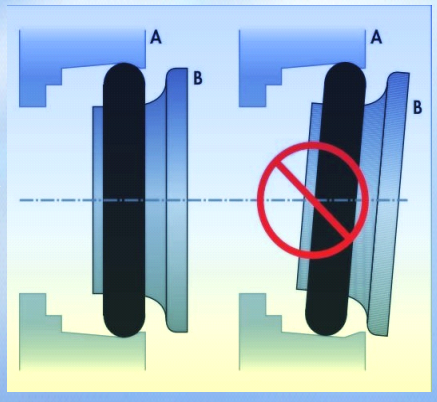
材料 Material	硬度 Hardness	温度范围 Temperature Range
HNBR	邵 SHORE A60-65	-30℃至150℃
FKM	邵 SHORE A60-65	-20℃至200℃
VQM	邵 SHORE A60-65	-50℃至200℃

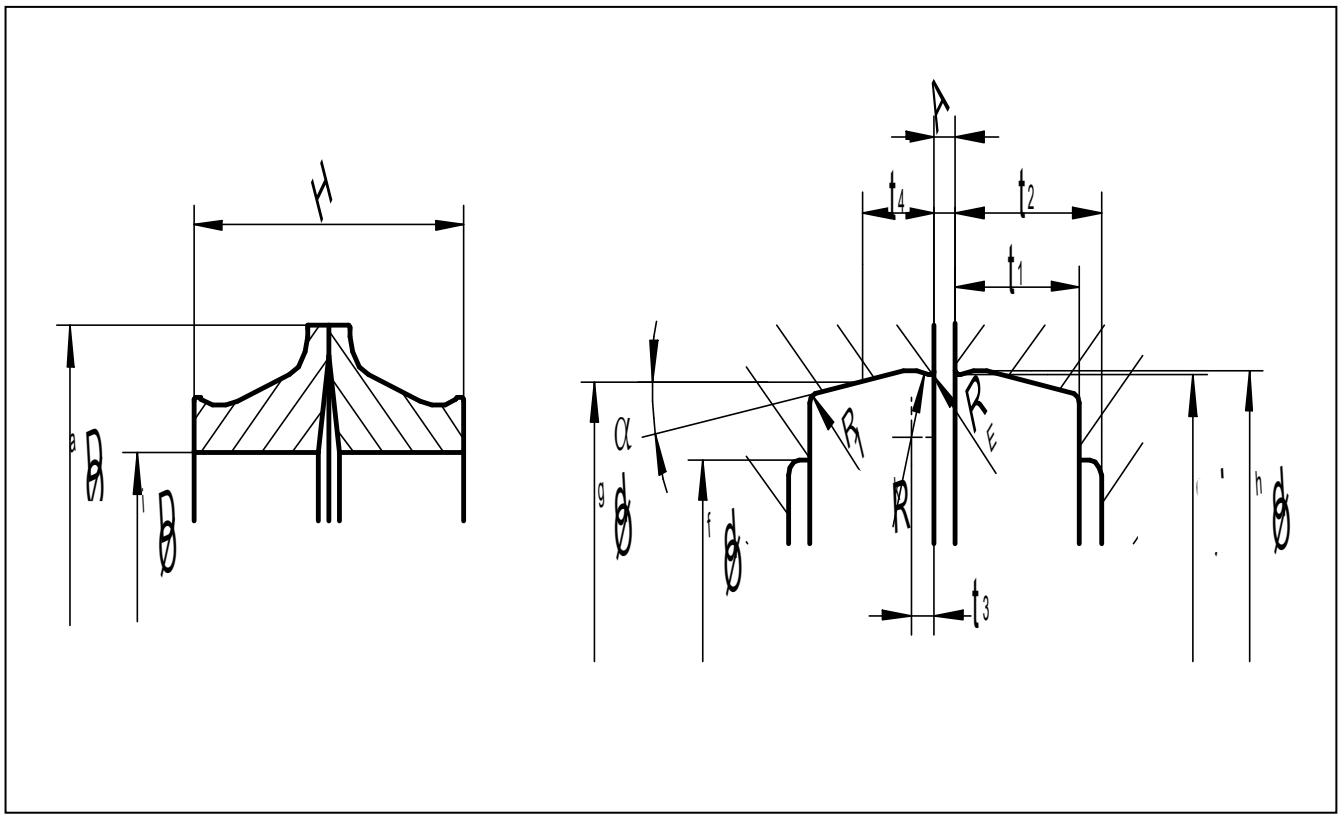
温度 Temperature:
-40℃~+200℃

压力 Pressure
≤0.3MPa(3bar)



安装 *Install*





DO型　浮动油封规格表

	A	ΦD1	ΦDa	H	ΦDh	ΦDe	ΦDf	Φdg	t1	t2min	t3	t4		Rk	α	±Tolfor
P/N	A	ΦDi	ΦDa	H	Φdh	Φde	Φdf	Φdg	t1	t2min	t3	t4	RE	Rk	α	+/- Tol fur
H-DOA0220	3	22.0	35.0	20.0	37.7	37.0	29.0	36.50	9.0	10.5	1.8	5.5	0.5	2.0	10°	0.10
H-DOA0250	3	25.0	38.0	20.0	40.7	40.0	34.0	39.50	9.0	10.5	1.8	5.5	0.5	2.0	10°	0.10
H-DOA0305	3	30.5	42.5	17.5	44.3	44.0	39.5	43.80	7.3	8.8	1.1	2.8	0.5	2.0	10°	0.10
H-DOA0340	1.5	34.0	45.0	14.0	47.0	46.5	42.0	46.30	6.5	8.0	1.0	3.0	0.5	1.0	10°	0.10
H-DOA0380	3	38.0	51.0	20.0	53.7	53.0	46.0	52.50	9.0	11.0	1.8	5.5	0.5	2.0	10°	0.10
H-DOB0380	3	38.0	51.0	20.4	53.7	53.0	46.0	52.50	9.0	11.0	1.8	5.5	0.5	2.0	10°	0.10
H-DOA0390	3	39.0	50.0	14.0	52.0	51.5	46.0	51.30	6.5	8.0	1.0	3.0	0.5	1.0	10°	0.10
H-DOA0400	3	40.0	52.0	20.0	55.0	54.2	46.0	52.66	9.0	11.0	1.0	5.5	0.5	1.0	15°	0.10
H-DOA0430	3	43.0	58.0	24.0	61.6	60.8	53.4	60.50	10.0	12.0	1.8	5.0	0.5	2.5	10°	0.10
H-DOA0435	3	43.5	58.0	24.0	61.6	61.0	52.0	60.10	11.0	13.5	2.8	7.5	0.5	5.0	10°	0.10
H-DOA0450	3	45.0	58.0	21.0	61.6	60.8	53.4	60.50	10.0	12.0	1.8	5.0	0.3	2.5	10°	0.10
H-DOB0450	3	45.0	58.0	21.6	61.6	61.0	54.0	60.55	10.5	12.5	1.8	5.0	0.5	2.5	10°	0.10

H-D0C0450	3	45.0	59.0	26.8	62.3	61.5	53.0	60.70	13.5	15.5	2.7	7.5	0.5	2.8	10°	0.10
H-D0A0460	3	46.0	59.0	20.0	62.5	61.8	56.0	61.40	8.5	10.5	1.8	5.0	0.5	2.0	10°	0.10
H-D0B0460	3	46.0	60.0	24.0	64.0	63.0	54.0	62.50	11.0	13.5	2.8	7.5	0.5	5.0	10°	0.10
H-D0A0480	1.5	48.0	58.0	14.4	59.9	59.4	55.0	59.40	6.3	8.0	1.5	3.0	0.5	1.7	10°	0.10
H-D0B0480	3	48.0	62.0	26.0	68.0	67.2	58.0	66.15	12.0	14.0	2.0	7.5	0.5	3.0	10°	0.10
H-D0C0480	3	48.0	62.15	25.0	68.0	67.2	58.0	66.15	12.0	14.0	2.0	7.5	0.4	3.0	10°	0.10
H-D0A0485	3	48.5	62	18.0	64.0	63.5	59.0	66.50	7.3	8.8	1.1	2.8	0.5	2.0	10°	0.10
H-D0A0510	3	51.0	65.6	26.8	68.0	67.2	62.0	66.40	13.5	15.5	2.7	7.5	0.5	2.8	10°	0.10
H-D0A0540	3	54.0	68.0	24.0	72.0	71.0	60.0	70.50	11.0	13.5	2.8	7.5	0.5	4.8	10°	0.10
H-D0A0550	3	55.0	67.0	18.0	69.1	68.6	64.0	68.60	7.3	8.8	1.1	2.8	0.5	2.0	10°	0.10
H-D0A0555	3	55.5	70.0	22.0	73.8	73.1	65.5	72.70	10.0	11.5	2.4	6.0	0.5	5.0	10°	0.10
H-D0A0560	3	56.0	70.0	25.0	76.0	75.2	66.0	74.20	12.5	14.5	2.0	7.5	0.5	3.0	10°	0.10
H-D0B0560	3	56.0	70.0	26.0	76.0	75.2	66.0	74.10	12.0	14.0	2.0	7.5	0.5	2.5	10°	0.10
H-D0C0560	3	56.0	70.0	26.3	76.0	75.0	66.0	74.20	12.5	14.5	2.0	7.5	0.5	2.8	10°	0.10
H-D0A0580	3	58.0	75.0	27.0	79.2	78.6	66.0	77.00	12.0	14.0	2.0	7.5	0.5	2.5	12°	0.10
H-D0B0580	3	58.0	77.5	36.0	82.2	81.2	70.0	80.30	18.0	20.5	3.1	9.0	0.5	6.0	10°	0.10
H-D0A0600	3	60.0	74.0	20.6	78.4	77.4	70.0	77.20	9.0	11.0	1.9	5.0	0.5	2.5	12°	0.10
H-D0A0602	3	60.2	73.0	20.0	76.5	75.8	69.0	75.40	8.5	10.5	1.8	5.0	0.5	2.0	10°	0.10
H-D0A0610	3	61.0	73.0	17.6	75.8	75.5	66.8	74.80	6.5	7.5	1.0	4.0	0.5	1.4	10°	0.10
H-D0B0610	3	61.0	83.0	30.0	85.2	84.2	75.0	83.70	14.5	17.0	2.8	7.5	0.5	5.0	10°	0.10
H-D0A0615	3	61.5	73.0	18.0	75.8	75.5	68.0	74.80	7.5	9.5	1.0	4.0	0.5	1.4	10°	0.10
H-D0A0630	3	63.0	80.5	26.0	84.0	83.2	72.0	82.90	11.5	13.0	2.5	6.0	0.5	5.0	10°	0.10
H-D0A0635	3	63.5	82.4	32.0	87.0	86.0	74.5	85.50	14.5	17.5	2.8	7.5	0.5	5.0	10°	0.10
H-D0B0635	3	63.5	82.5	31.8	86.5	85.7	73.5	85.20	15.2	16.8	3.5	7.5	0.5	4.8	10°	0.10
H-D0A0640	3	64.0	78.0	25.0	84.6	83.8	74.0	82.40	12.5	14.5	2.0	7.5	0.4	3.0	12°	0.10
H-D0A0660	3	66.0	85.0	26.0	90.5	89.5	76.0	88.60	12.0	14.0	2.0	7.5	0.5	2.0	10°	0.10
H-D0B0660	3	66.0	85.0	28.0	90.0	89.2	78.0	88.15	14.0	16.0	2.0	7.5	0.5	3.0	10°	0.10
H-D0C0660	3	66.0	86.0	28.0	90.0	89.2	78.0	88.15	14.0	16.0	2.0	7.5	0.5	3.0	10°	0.10
H-D0A0670	3	67.0	80.0	20.0	83.4	82.7	76.8	82.30	8.5	10.5	1.8	5.0	0.5	2.0	10°	0.10
H-D0A0675	3	67.5	86.5	31.8	91.0	90.0	78.0	89.50	14.5	17.0	2.8	7.5	0.5	5.0	10°	0.15
H-D0A0685	3	68.5	89.0	24.0	92.5	91.5	83.0	91.00	11.0	13.5	2.8	7.5	0.5	5.0	10°	0.10
H-D0A0690	3	69.0	84.0	24.0	89.6	88.6	78.5	87.35	11.0	13.0	1.9	7.5	0.5	3.0	12°	0.10
H-D0B0690	3	69.0	89.0	24.0	92.5	91.5	83.0	91.00	11.0	13.5	2.8	7.5	0.5	5.0	10°	0.10
H-D0A0700	3	70.0	84.0	20.0	86.5	85.7	55.0	85.40	9.0	11.0	1.8	5.0	0.5	2.0	10°	0.10

H-D0B0700	3	70.0	87.0	21.0	91.8	90.8	84.0	90.60	9.2	10.0	2.3	6.0	0.5	3.0	10°	0.10
H-D0C0700	3	70.0	90.0	28.0	95.0	94.0	84.0	93.15	13.5	15.5	2.0	7.5	0.5	3.0	10°	0.10
H-D0D0700	3	70.0	90.0	29.0	95.5	94.7	84.0	93.30	13.5	15.5	2.0	7.5	0.5	3.0	12°	0.10
H-D0A0710	3	71.0	84.0	20.0	87.4	86.7	80.8	86.30	8.5	10.5	1.8	5.0	0.5	2.0	10°	0.10
H-D0A0725	3	72.5	92.0	35.6	96.0	95.2	83.0	94.20	15.2	20.9	3.5	9.0	0.5	4.8	10°	0.10
H-D0A0730	3	73.0	92.0	31.8	96.2	95.4	84.0	94.70	15.0	17.0	3.0	7.5	0.5	4.0	10°	0.10
H-D0B0730	3	73.0	92.0	32.0	96.5	95.5	84.0	95.00	14.5	17.5	2.8	7.5	0.5	5.0	10°	0.15
H-D0A0731	3	73.1	91.9	31.8	96.0	95.2	83.0	94.70	15.2	16.8	3.5	7.5	0.5	4.8	10°	0.10
H-D0A0735	3	73.5	88.5	20.4	90.2	89.4	82.0	89.30	12.7	14.3	2.2	5.0	0.5	2.8	10°	0.10
H-D0A0740	3	74.0	86.0	22.0	91.0	90.0	81.0	89.80	10.0	11.5	2.3	6.0	0.5	3.0	10°	0.10
H-D0B0740	3	74.0	86.5	22.5	91.4	90.7	80.0	90.10	9.5	11.5	2.0	6.0	0.5	3.0	10°	0.10
H-D0C0740	3	74.0	93.0	30.0	101.5	100.5	84.0	99.10	14.0	16.0	2.0	7.5	0.5	2.0	13°	0.10
H-D0A0746	3	74.6	93.3	29.0	101.7	99.9	84.0	99.20	15.0	17.0	2.8	7.5	0.5	5.0	10°	0.10
H-D0A0750	3	75.0	94.0	29.0	101.4	100.6	89.0	99.55	14.5	16.5	2.0	7.5	0.5	3.0	10°	0.10
H-D0B0750	3	75.0	94.5	32.0	98.0	97.0	86.0	96.50	14.5	17.0	2.8	7.5	0.5	5.0	10°	0.10
H-D0A0760	3	76.0	94.0	29.0	101.4	100.6	89.0	99.55	14.5	16.5	2.0	7.5	0.5	3.0	10°	0.10
H-D0A0775	1	77.5	87.5	14.0	90.7	90.2	85.5	89.70	7.0	8.0	1.5	3.5	0.5	1.5	15°	0.10
H-D0B0775	1	77.5	87.6	13.6	90.7	90.2	89.5	89.70	7.5	8.0	1.4	3.5	0.5	1.5	15°	0.10
H-D0C0775	1	77.5	88.5	15.0	90.7	90.2	85.5	89.70	7.0	8.0	1.5	3.5	0.5	1.5	10°	0.10
H-D0A0790	3	79.0	100.0	30.0	105.2	104.2	92.0	103.50	15.0	17.0	2.5	7.5	0.7	3.0	10°	0.20
H-D0A0795	3	79.5	92.5	20.0	96.0	95.3	88.0	94.90	8.5	10.5	1.8	5.0	0.5	2.0	10°	0.10
H-D0A0800	3	80.0	100.0	29.0	104.0	103.2	92.0	102.15	14.5	16.5	2.0	7.5	0.4	3.0	10°	0.10
H-D0B0800	3	80.0	100.0	30.0	105.0	104.5	90.0	103.00	14.0	16.0	3.0	7.5	0.5	2.0	13°	0.10
H-D0A0810	3	81.0	98.0	28.0	102.3	101.3	91.0	100.80	12.5	14.5	2.8	7.5	0.5	5.0	10°	0.10
H-D0A0825	3	82.5	102.0	35.6	107.3	106.5	94.3	105.50	15.2	20.9	3.5	9.0	0.5	4.8	10°	0.10
H-D0A0830	3	83.0	102.0	28.0	105.5	104.5	94.0	104.00	12.5	15.0	2.8	7.5	0.5	5.0	10°	0.10
H-D0A0845	3	84.5	104.5	16.0	109.0	108.0	99.0	107.50	14.5	17.0	2.8	7.5	0.5	5.0	10°	0.10
H-D0A0880	3	88.0	108.0	24.0	111.5	110.5	102.0	110.00	11.0	13.5	2.8	7.5	0.5	5.0	10°	0.10
H-D0A0890	3	89.0	108.0	29.4	113.0	112.0	100.8	111.47	13.0	15.6	2.6	7.5	0.5	4.0	9.5°	0.10
H-D0A0900	3	90.0	105.0	26.0	107.3	106.7	100.4	105.80	11.8	14.2	2.9	7.5	0.5	2.8	10°	0.10
H-D0B0900	3	90.0	109.0	32.0	112.5	111.7	104.0	110.80	14.5	17.0	3.2	7.5	0.5	3.0	12°	0.10
H-D0A0904	3	90.4	109.4	31.8	113.4	112.7	100.4	112.10	15.2	16.8	3.5	7.5	0.5	4.8	10°	0.10
H-D0B0904	3	90.4	109.5	35.6	113.4	112.7	100.4	112.10	15.2	20.9	3.5	7.5	0.5	4.8	10°	0.10
H-D0A0905	3	90.5	104.5	26.0	107.4	106.6	100.4	105.90	11.8	14.2	2.9	7.5	1.2	2.8	10°	0.10

H-D0B0905	3	90.5	109.5	31.8	114.0	113.0	101.5	112.50	14.5	17.5	2.8	7.5	0.5	5.0	10°	0.15
H-D0C0905	3	90.5	109.5	32.0	114.0	113.0	101.5	112.50	14.5	17.5	2.8	7.5	0.5	5.0	10°	0.15
H-D0A0910	3	91.0	110.0	32.0	114.0	113.0	101.5	112.50	14.5	17.5	2.8	7.5	0.5	5.0	10°	0.10
H-D0A0920	3	92.0	109.0	22.0	113.8	112.8	104.0	112.60	10.0	11.5	2.3	6.0	0.5	3.0	10°	0.10
H-D0A0940	3	94.0	106.5	23.0	111.6	110.8	102.0	110.30	9.5	11.5	2.0	6.0	0.5	3.0	10°	0.10
H-D0B0940	3	94.0	107.0	22.0	112.0	111.0	102.0	110.80	10.0	11.5	2.3	6.0	0.5	3.0	10°	0.10
H-D0A0950	3	95.0	114.0	32.0	120.0	119.2	107.0	118.00	15.0	17.0	2.5	7.5	0.5	3.0	12°	0.10
H-D0A0960	3	96.0	120.0	32.0	125.0	123.0	106.0	123.00	15.0	17.0	3.0	7.5	0.5	2.0	13°	0.10
H-D0A0962	3	96.2	111.0	24.0	115.6	114.8	108.0	114.00	11.0	12.5	1.8	6.5	0.5	2.0	10°	0.10
H-D0A0965	3	96.5	106.8	13.6	109.7	109.2	108.5	108.70	7.5	8.0	1.4	3.5	0.5	1.5	15°	0.10
H-D0A0970	3	97.0	116.0	32.0	120.5	119.5	108.0	119.00	14.5	17.5	2.8	7.5	0.5	5.0	10°	0.15
H-D0A0980	3	98.0	119.0	29.6	124.2	123.2	111.0	122.70	14.5	17.0	2.8	7.5	0.5	5.0	10°	0.15
H-D0A0990	3	99.0	120.0	28.0	123.5	122.5	112.0	122.00	12.5	14.5	2.8	7.5	0.5	5.0	10°	0.10
H-D0A1000	3	100.0	119.0	32.0	123.5	122.5	111.0	122.00	14.5	17.5	2.8	7.5	0.5	5.0	10°	0.15
H-D0B1000	3	100.0	119.1	31.8	123.0	122.2	110.0	121.70	15.2	16.8	3.5	7.5	0.5	4.8	10°	0.10
H-D0A1001	3	100.1	119.1	31.8	123.0	122.2	110.0	121.70	15.2	16.8	3.5	7.5	0.5	4.8	10°	0.10
H-D0A1010	3	101.0	120.0	30.0	125.0	124.0	111.0	123.50	14.5	17.0	2.8	7.5	0.5	5.0	10°	0.10
H-D0A1020	3	102.0	118.0	27.0	124.0	123.0	112.0	122.50	12.0	14.5	2.8	7.5	0.5	5.0	10°	0.10
H-D0B1020	3	102.0	122.0	33.4	127.2	126.2	115.0	125.20	15.5	17.5	2.5	7.5	0.5	3.0	12°	0.10
H-D0A1030	3	103.0	117.0	20.0	119.8	119.0	112.5	118.70	9.0	11.0	1.8	5.0	0.5	2.0	10°	0.10
H-D0B1030	3	103.0	122.0	32.0	127.2	126.2	115.0	125.20	15.5	17.5	2.5	7.5	0.5	3.0	12°	0.10
H-D0A1040	3	104.0	117.0	21.0	121.0	120.2	107.0	119.70	9.5	11.5	2.0	6.0	0.5	3.0	10°	0.10
H-D0AB1040	3	104.0	117.0	22.0	121.0	120.2	107.0	119.70	9.5	11.5	2.0	6.0	0.5	3.0	10°	0.10
H-D0C1040	3	104.0	122.0	22.0	125.8	124.8	117.0	124.60	10.0	11.5	2.3	6.0	0.5	3.0	10°	0.10
H-D0D1040	3	104.0	122.5	22.5	125.5	125.1	117.5	124.20	9.5	11.5	2.0	6.0	0.5	3.0	10°	0.10
H-D0E1040	3	104.0	125.0	28.0	128.5	127.5	117.0	127.00	12.5	14.0	2.8	7.5	0.5	5.0	10°	0.10
H-D0A1070	3	107.0	123.0	23.0	125.5	125.1	117.5	124.30	9.5	11.5	1.8	5.5	0.7	3.0	10°	0.10
H-D0B1070	3	107.0	125.0	24.0	130.4	129.4	119.5	128.90	11.0	13.5	2.8	7.5	0.5	5.0	10°	0.10
H-D0A1090	3	109.0	132.0	32.0	136.5	135.5	124.0	134.80	15.5	17.5	2.5	7.5	0.5	3.0	10°	0.10
H-D0A1095	3	109.5	127.0	32.0	132.6	131.3	121.0	131.10	14.5	17.0	2.8	7.5	0.5	5.0	10°	0.10
H-D0A1100	3	110.0	127.0	32.0	132.6	131.5	120.0	130.75	15.0	17.0	2.0	7.5	0.5	3.0	10°	0.10
H-D0B1100	3	110.0	128.0	32.0	133.0	132.0	121.0	131.00	15.0	17.0	2.5	7.5	0.7	3.0	12°	0.10
H-D0A1110	3	111.0	128.0	22.0	132.5	132.0	123.0	131.46	10.6	12.3	2.8	6.0	0.5	3.0	10°	0.10
H-D0A1120	3	112.0	131.0	32.0	135.5	134.5	124.0	134.00	14.5	17.0	2.8	7.5	0.5	5.0	10°	0.10

H-DOA1145	3	114.5	129.0	21.0	134.1	133.1	126.0	132.90	9.2	10.0	2.3	6.0	0.5	3.0	10°	0.10
H-DOA1150	3	115.0	137.0	31.0	141.8	140.8	130.0	140.10	14.5	16.5	2.5	7.5	0.5	3.0	10°	0.10
H-DOB1150	3	115.0	137.0	32.0	144.0	143.0	125.0	142.00	15.0	17.0	3.0	7.5	0.5	2.0	13°	0.10
H-DOA1170	3	117.0	138.0	31.8	142.5	141.5	132.0	141.00	14.5	17.0	2.8	7.5	0.5	5.0	10°	0.10
H-DOB1170	3	117.0	140.0	28.0	142.5	141.5	132.0	141.00	12.5	14.0	2.8	7.5	0.5	5.0	10°	0.10
H-DOC1170	3	117.0	140.0	29.0	142.5	141.5	132.0	141.00	13.0	14.0	2.8	7.5	0.5	5.0	10°	0.15
H-DOA1185	3	118.5	139.5	28.0	143.0	142.0	131.5	141.50	12.5	15.0	2.8	7.5	0.5	5.0	10°	0.10
H-DOA1200	3	120.0	138.0	32.0	142.5	141.5	132.0	141.00	14.5	17.0	2.8	7.5	0.5	5.0	10°	0.10
H-DOC1200	3	120.0	139.0	31.8	143.8	142.8	132.0	142.30	14.5	17.0	2.8	7.5	0.5	5.0	10°	0.15
H-DOD1200	3	120.0	141.0	31.8	144.0	143.0	138.0	142.50	14.5	17.5	2.8	7.5	0.5	5.0	10°	0.10
H-DOE1200	4	120.0	142.0	38.0	149.0	148.0	133.0	146.80	17.0	19.0	2.5	9.0	0.7	3.0	10°	0.10
H-DOA1240	3	124.0	141.0	22.0	146.4	145.3	136.0	145.40	10.6	12.3	2.8	6.0	0.5	3.0	9.5°	0.10
H-DOA1250	3	125.0	144.0	31.8	148.5	147.5	136.0	147.00	14.5	17.0	2.8	7.5	0.5	5.0	10°	0.15
H-DOB1250	3	125.0	144.1	31.8	148.5	147.5	136.0	147.07	14.3	17.4	3.0	7.5	0.5	5.0	10°	0.10
H-DOA1260	3	126.0	146.0	31.8	150.0	149.2	137.0	148.70	15.2	16.8	3.5	7.5	0.5	4.8	10°	0.10
H-DOA1265	3	126.5	139.0	26.8	143.8	143.1	136.9	142.26	11.8	14.2	2.9	7.5	0.5	2.8	10°	0.10
H-DOA1270	3	127.0	140.7	25.0	144.0	143.2	135.0	142.40	12.7	15.2	2.7	7.5	1.0	2.8	10°	0.10
H-DOB1270	3	127.0	141.0	29.0	148.2	147.2	135.0	146.70	13.2	15.5	2.8	7.5	0.5	5.0	10°	0.15
H-DOC1270	3	127.0	141.2	25.4	143.8	143.1	136.9	142.26	11.8	14.2	2.9	7.5	0.5	2.8	10°	0.10
H-DOD1270	3	127.0	146.0	31.0	150.2	149.4	137.0	148.60	14.5	16.5	2.6	7.5	0.5	5.0	10°	0.15
H-DOE1270	3	127.0	146.0	31.8	150.0	149.2	137.0	148.70	15.2	16.8	3.5	7.5	0.5	4.8	10°	0.10
H-DOF1270	3	127.0	146.0	32.0	150.5	149.5	138.0	149.00	14.5	17.5	2.8	7.5	0.5	5.0	10°	0.15
H-DOA1300	3	130.0	150.0	32.0	158.0	157.0	140.0	156.00	15.0	17.5	3.0	7.5	0.5	2.0	13°	0.10
H-DOB1300	3	130.0	152.0	38.5	159.0	158.0	144.0	156.80	18.5	20.5	2.5	9.0	0.5	3.0	10°	0.10
H-DOA1355	3	135.5	154.5	28.0	158.3	157.3	146.5	156.80	12.5	14.0	2.8	7.5	0.5	5.0	10°	0.15
H-DOA1360	3	136.0	155.0	30.0	159.7	158.7	145.0	158.20	14.5	17.0	2.8	7.5	0.5	5.0	10°	0.15
H-DOA1370	3	137.0	153.0	30.0	161.7	160.7	143.0	160.20	14.5	17.0	2.8	7.5	0.5	5.0	10°	0.15
H-DOA1400	3	140.0	155.0	26.0	158.6	157.4	150.0	157.10	12.5	15.0	2.8	7.5	0.5	5.0	10°	0.10
H-DOA1420	3	142.0	160.0	33.0	166.0	165.0	152.0	164.00	16.5	18.5	3.1	9.0	0.5	3.0	10°	0.10
H-DOA1427	3	142.7	156.9	25.4	159.7	158.9	152.1	158.16	11.8	14.2	2.9	7.5	0.5	2.8	10°	0.10
H-DOA1430	3	143.0	156.5	25.0	159.7	158.9	152.0	158.00	11.5	13.5	2.5	7.5	0.5	3.0	10°	0.10
H-DOB1430	3	143.0	157.0	27.0	160.0	159.0	152.0	158.30	12.0	14.5	2.3	7.5	0.5	3.0	10°	0.10
H-DOC1430	3	143.0	160.0	27.0	164.0	163.0	154.0	162.50	12.0	14.5	2.8	7.5	0.5	5.0	10°	0.10
H-DOA1460	3	146.0	168.0	38.0	176.8	175.9	159.0	174.90	18.0	20.5	3.0	9.0	0.5	6.5	10°	0.10
H-DOB1460	3	146.0	172.0	38.0	177.0	176.0	159.0	175.10	18.0	20.5	3.1	9.0	0.5	6.5	10°	0.20

H-DOC1460	3	146.0	175.0	38.0	180.5	179.5	162.0	178.60	17.7	20.5	3.1	9.0	0.5	6.5	10°	0.20
H-DOA1463	3	146.3	171.7	38.0	176.8	175.9	158.9	175.10	18.4	20.3	3.7	9.0	0.5	6.3	10°	0.10
H-DOA1470	3	147.0	167.0	28.0	171.0	170.0	160.0	169.50	13.0	15.5	2.8	7.5	0.5	5.0	10°	0.10
H-DOA1480	3	148.0	170.0	31.0	175.6	174.6	164.0	173.90	15.0	17.0	2.5	7.5	0.5	3.0	10°	0.10
H-DOA1490	3	149.0	168.0	26.0	171.0	170.0	159.0	169.65	12.0	14.5	3.5	7.5	0.5	2.0	10°	0.10
H-DOA1500	3	150.0	167.0	28.0	171.0	170.0	160.0	169.50	13.0	15.5	2.8	7.5	0.5	5.0	10°	0.10
H-DOB1500	3	150.0	171.0	32.0	175.6	174.6	164.0	174.10	14.5	17.0	2.8	7.5	0.5	5.0	10°	0.10
H-DOC1500	4	150.0	172.0	40.0	179.0	178.0	165.0	177.30	18.0	20.0	2.5	7.5	0.7	3.0	10°	0.10
H-DOD1500	3	150.0	172.0	39.0	177.3	176.3	165.0	175.60	18.0	20.0	2.5	7.5	0.5	3.0	10°	0.10
H-DOA1520	3	152.0	171.5	32.0	175.4	174.7	162.5	174.10	15.2	16.8	3.5	7.5	0.5	4.8	10°	0.10
H-DOA1530	3	153.0	171.5	28.0	176.3	175.3	164.5	174.80	12.5	14.5	2.8	7.5	0.5	5.0	10°	0.10
H-DOA1535	3	153.5	172.5	32.0	178.0	177.0	166.0	176.50	14.5	17.0	2.8	7.5	0.5	5.0	10°	0.15
H-DOA1539	3	153.9	168.1	25.4	171.0	170.2	164.0	169.46	11.8	14.2	2.9	7.5	0.5	2.8	10°	0.10
H-DOA1540	3	154.0	168.0	27.0	171.0	170.0	162.5	169.30	12.0	14.5	2.3	7.5	0.5	3.0	10°	0.10
H-DOB1540	3	154.0	169.0	22.0	174.5	173.5	166.0	173.30	9.5	11.0	2.3	6.0	0.5	3.0	10°	0.10
H-DOC1540	3	154.0	170.0	21.0	175.1	174.1	167.0	173.90	9.2	11.0	2.3	6.0	0.5	3.0	10°	0.10
H-DOD1540	3	154.0	173.5	31.8	178.0	177.0	166.0	176.50	14.5	17.0	2.8	7.5	0.5	5.0	10°	0.15
H-DOE1540	3	154.0	173.5	32.0	178.0	177.0	166.0	176.50	14.5	17.0	2.8	7.5	0.5	5.0	10°	0.15
H-DOF1540	3	154.0	178.0	34.0	181.0	180.0	171.0	179.10	18.0	20.5	3.1	9.0	0.5	6.0	10°	0.20
H-DOG1540	3	154.0	180.0	38.0	185.0	184.0	167.0	183.10	18.0	20.5	3.1	9.0	0.5	6.5	10°	0.20
H-DOA1550	3	155.0	168.0	27.0	170.8	169.8	163.0	169.10	12.0	14.5	2.3	7.5	0.5	3.0	10°	0.10
H-DOB1550	3	155.0	177.0	39.0	180.0	179.0	165.0	177.40	18.0	20.5	3.0	9.0	0.5	3.0	13°	0.10
H-DOA1600	3	160.0	180.0	32.0	186.3	185.5	174.0	184.80	14.5	17.0	2.8	7.5	0.5	5.0	10°	0.15
H-DOA1630	3	163.0	191.5	38.0	196.5	195.5	178.5	194.60	18.0	20.5	3.1	9.0	0.5	6.5	10°	0.20
H-DOA1633	3	163.3	191.2	38.0	196.8	195.9	178.9	195.10	18.4	20.3	3.7	9.0	0.5	6.3	10°	0.15
H-DOB1633	3	163.3	191.3	46.0	196.8	195.9	178.9	195.10	18.4	24.1	3.7	9.0	0.5	6.3	10°	0.15
H-DOA1640	3	164.0	189.0	30.0	193.5	192.5	179.0	192.00	14.5	17.0	2.8	7.5	0.5	5.0	10°	0.15
H-DOA1650	3	165.0	180.5	27.0	185.0	184.0	176.5	183.30	12.0	14.5	2.3	7.5	0.5	3.0	10°	0.10
H-DOC1650	3	165.0	183.0	28.0	188.0	187.0	176.0	186.50	12.5	14.5	2.8	7.5	0.5	5.0	10°	0.10
H-DOA1670	3	167.0	194.0	38.0	198.0	197.0	177.0	195.40	18.0	20.5	3.0	9.0	0.5	3.0	13°	0.10
H-DOA1713	3	171.3	185.3	20.0	188.0	187.3	180.0	186.80	9.0	11.0	1.8	5.5	0.5	2.0	10°	0.10
H-DOA1720	3	172.0	194.4	31.8	198.9	197.9	186.0	197.40	14.5	16.5	2.8	7.5	0.5	5.0	10°	0.15
H-DOA1725	3	172.5	190.0	25.4	192.7	191.8	188.0	190.95	12.7	14.3	2.3	7.5	0.5	2.8	10°	0.15
H-DOA1740	3	174.0	190.0	25.4	192.7	191.8	188.0	190.95	12.7	14.3	2.3	7.5	0.5	2.8	10°	0.15
H-DOA1760	3	176.0	195.0	28.0	199.8	198.8	188.0	198.30	12.5	14.5	2.8	7.5	0.5	5.0	10°	0.10

H-DOA1770	3	177.0	200.0	30.0	204.5	203.5	191.0	203.00	14.5	17.0	2.8	7.5	0.5	5.0	10°	0.15
H-DOB1770	3	177.0	200.0	31.0	204.5	203.4	191.0	203.10	14.5	17.0	3.1	7.5	0.5	5.0	10°	0.15
H-DOA1780	3	178.0	197.4	21.4	202.2	201.9	196.0	200.60	9.4	10.6	1.2	6.0	0.5	3.0	10°	0.15
H-DOB1780	3	178.0	199.0	32.0	203.6	202.6	190.0	202.10	14.5	17.0	2.8	7.5	0.5	5.0	10°	0.15
H-DOC1780	4	178.0	200.0	38.0	210.6	209.6	192.0	209.00	19.0	21.0	3.0	8.0	0.5	4.0	10°	0.15
H-DOD1780	4	178.0	205.0	38.0	210.6	209.6	192.0	209.00	19.0	21.0	3.0	8.0	0.8	4.0	10°	0.10
H-DOA197.5	3	179.5	197.5	22.0	202.7	201.8	187.0	201.50	10.0	11.5	2.3	6.0	0.5	3.0	10°	0.10
H-DOA1800	3	180.0	198.0	22.0	202.7	201.8	187.0	201.50	10.0	11.5	2.3	6.0	0.5	3.0	10°	0.10
H-DOA1820	3	182.0	210.5	38.0	215.5	214.5	197.5	213.60	18.0	20.5	3.1	9.0	0.5	6.5	10°	0.20
H-DOA1823	3	182.3	210.3	38.0	215.4	214.4	197.5	213.70	18.4	20.3	3.7	9.0	0.5	6.3	10°	0.15
H-DOA1824	3	182.4	210.3	46.0	215.4	214.4	197.5	213.70	18.4	24.1	3.7	9.0	0.5	6.3	10°	0.15
H-DOA1860	3	186.0	203.0	32.0	204.1	202.9	190.5	202.70	14.5	16.0	3.0	7.5	0.5	5.0	10°	0.15
H-DOB1860	3	186.0	203.0	25.4	205.7	204.8	192.0	204.00	12.7	14.3	2.3	7.5	0.5	2.8	10°	0.10
H-DOA1900	3	190.0	216.0	44.0	224.0	223.0	260.5	221.70	20.5	22.5	3.1	10.0	0.5	3.0	10°	0.20
H-DOA1910	3	191.0	210.0	28.0	214.0	213.0	203.0	212.50	12.5	14.5	2.8	7.5	0.5	5.0	10°	0.10
H-DOA1920	3	192.0	209.0	30.0	213.5	212.5	200.0	212.00	14.5	17.0	2.8	7.5	0.5	5.0	10°	0.15
H-DOB1920	4	192.0	215.0	33.0	220.8	219.8	207.0	219.30	16.5	18.5	3.0	7.5	0.5	4.0	10°	0.15
H-DOA1930	3	193.0	218.0	38.0	225.0	224.0	208.0	223.10	18.0	20.5	3.1	9.0	0.5	6.5	10°	0.15
H-DOA1950	3	195.0	216.5	31.8	221.0	220.0	207.0	219.50	14.5	17.0	2.8	7.5	0.5	5.0	10°	0.15
H-DOA2000	3	200.0	228.5	38.0	233.5	232.5	215.5	231.60	18.0	20.5	3.1	9.0	0.5	6.5	10°	0.20
H-DOA2010	3	201.0	222.3	26.5	224.9	224.1	217.9	223.40	11.8	14.2	2.9	7.5	0.5	2.8	10°	0.15
H-DOA2020	3	202.0	227.0	30.0	231.5	230.5	217.0	230.00	14.5	17.0	2.8	7.5	0.5	5.0	10°	0.15
H-DOA2050	3	205.0	227.0	30.0	231.5	230.5	219.0	230.00	14.5	17.0	2.8	7.5	0.5	5.0	10°	0.15
H-DOA2087	3	208.7	222.8	26.0	225.4	224.4	217.0	224.10	11.5	13.5	2.2	6.0	0.5	2.5	10°	0.10
H-DOA2090	3	209.0	234.0	42.0	242.6	241.6	224.0	240.40	19.5	22.5	3.0	9.5	0.5	4.0	10°	0.15
H-DOA2100	3	210.0	240.0	40.0	246.4	245.4	228.0	244.50	18.0	20.5	3.1	9.0	0.5	6.5	10°	0.15
H-DOA2160	3	216.0	237.0	30.0	241.5	240.5	229.0	240.00	14.5	17.0	2.8	7.5	0.5	5.0	10°	0.15
H-DOA2170	3	217.0	240.0	36.0	244.0	243.0	228.0	242.10	18.0	20.5	3.1	9.0	0.5	6.0	10°	0.20
H-DOA2200	3	220.0	239.5	31.8	244.0	243.0	232.0	242.50	14.5	16.5	2.8	7.5	0.5	5.0	10°	0.15
H-DOB2200	3	220.0	241.4	25.0	244.7	244.0	233.5	243.30	11.0	13.5	2.2	6.5	0.5	4.0	10°	0.10
H-DOC2200	3	220.0	246.0	36.0	251.6	249.0	235.0	249.20	15.0	17.5	2.0	9.0	0.5	3.0	10°	0.15
H-DOD2200	3	220.0	246.0	41.0	254.6	253.6	236.0	252.50	20.5	22.5	3.0	9.5	0.5	4.0	10°	0.15
H-DOA2220	3	222.0	246.0	36.0	251.6	250.6	236.5	249.60	17.0	19.5	2.8	9.0	0.5	5.0	10°	0.15
H-DOA2230	3	223.0	251.5	38.0	256.5	255.5	238.5	254.60	18.0	20.5	3.1	9.0	0.5	6.5	10°	0.20

H-D0B2230	3	223.0	252.0	38.0	256.5	255.5	238.0	254.60	18.0	20.5	3.1	9.0	0.5	6.5	10°	0.20
H-D0A2235	3	223.5	251.4	38.0	256.6	255.7	238.7	254.90	18.4	20.3	3.7	9.0	0.5	6.3	10°	0.15
H-D0B2235	3	223.5	251.5	46.0	256.6	255.7	238.7	254.90	18.4	24.1	3.7	9.0	0.5	6.3	10°	0.15
H-D0A2250	3	225.0	252.0	38.0	258.0	257.0	241.0	256.00	19.0	21.0	3.0	9.0	0.5	4.0	10°	0.20
H-D0B2250	3	225.0	253.0	38.0	258.0	257.0	241.0	256.10	18.0	20.5	3.1	9.0	0.5	6.5	10°	0.20
H-D0A2300	3	230.0	260.0	36.0	265.0	264.0	245.0	263.10	17.0	19.5	3.0	9.0	0.5	6.5	10°	0.20
H-D0A2316	5	231.6	259.6	38.0	264.7	263.8	247.0	263.00	18.4	20.5	3.7	9.0	0.5	6.3	10°	0.20
H-D0A2340	3	234.0	260.0	36.0	264.5	263.5	250.0	262.50	17.5	19.5	3.0	9.0	0.5	4.0	10°	0.20
H-D0A2350	5	235.0	259.7	38.0	264.7	263.7	247.0	262.80	18.0	20.5	3.1	9.0	0.5	6.5	10°	0.20
H-D0A2380	3	238.0	261.0	31.8	265.5	264.5	254.0	264.00	14.5	17.0	2.8	7.5	0.5	5.0	10°	0.15
H-D0A2390	3	239.0	268.0	40.0	274.2	273.2	257.0	272.20	20.5	22.5	3.0	9.0	0.5	4.0	10°	0.20
H-D0A2400	3	240.0	262.8	38.0	273.5	272.5	255.5	271.60	18.0	20.5	3.1	9.0	0.5	6.5	10°	0.20
H-D0A2420	3	242.0	262.8	40.0	273.5	272.5	255.5	271.60	18.0	20.5	3.1	9.0	0.5	6.5	10°	0.20
H-D0A2450	3	245.0	264.5	32.0	268.9	267.9	258.0	267.40	14.5	17.0	2.8	7.5	0.5	5.0	10°	0.20
H-D0A2500	3	250.0	270.0	30.0	274.7	273.7	262.0	273.20	14.0	15.5	2.8	7.5	0.5	5.0	10°	0.20
H-D0B2500	3	250.0	276.0	44.0	284.6	283.6	266.0	282.30	20.5	24.0	3.0	10.0	0.5	4.0	10°	0.20
H-D0A2520	3	252.0	280.0	38.0	285.5	284.5	267.0	283.60	18.0	20.5	3.1	9.0	0.5	6.5	10°	0.20
H-D0B2520	3	252.0	280.5	38.0	285.5	284.5	267.5	283.60	18.0	20.5	3.1	9.0	0.5	6.5	10°	0.20
H-D0A2600	3	260.0	288.0	40.0	295.0	294.0	275.0	293.10	18.0	20.5	3.1	9.0	0.5	6.5	10°	0.20
H-D0B2600	3	260.0	293.0	38.0	298.0	297.0	275.0	296.10	18.0	20.5	3.1	9.0	0.5	6.5	10°	0.20
H-D0A2620	7	262.0	288.0	40.0	294.0	293.0	276.0	292.00	17.0	20.0	3.8	10.0	1.2	6.0	10°	0.15
H-D0A2649	3	264.9	292.8	38.0	297.8	297.0	280.0	296.10	18.4	20.3	3.7	9.0	0.5	6.3	10°	0.20
H-D0A2650	3	265.0	292.8	46.0	297.8	297.0	280.0	296.10	18.4	24.1	3.7	9.0	0.5	6.3	10°	0.20
H-D0B2650	3	265.0	293.0	38.0	298.0	297.0	280.0	296.10	18.0	20.5	3.1	9.0	0.5	6.5	10°	0.20
H-D0A2720	3	272.0	300.0	40.0	306.0	305.0	287.0	304.10	18.5	21.0	3.0	9.0	0.5	6.5	10°	0.20
H-D0A2750	3	275.0	303.0	38.0	308.0	307.0	290.0	306.10	18.0	20.5	3.1	9.0	0.5	6.5	10°	0.20
H-D0A2770	3	277.0	310.0	38.0	315.5	314.5	303.0	313.30	17.5	20.5	3.1	10.0	0.5	6.5	10°	0.20
H-D0A2825	3	282.5	311.0	38.0	316.3	315.4	298.0	314.40	18.0	20.5	3.1	9.0	0.5	6.5	10°	0.20
H-D0A2829	3	282.9	310.8	38.0	316.3	315.4	298.4	314.60	18.4	20.3	3.7	9.0	0.5	6.3	10°	0.20
H-D0A3000	3	300.0	325.0	38.0	335.5	334.5	318.0	333.30	17.5	20.5	3.1	10.0	0.5	6.5	10°	0.20
H-D0B3000	4	300.0	328.0	38.0	333.0	332.0	315.0	330.80	19.5	22.0	3.0	9.5	0.8	4.0	10°	0.20
H-D0C3000	3	300.0	328.0	40.0	333.0	332.0	315.0	330.80	18.5	21.0	3.0	9.5	0.5	4.0	10°	0.20
H-D0D3000	3	300.0	328.0	41.0	332.0	331.0	315.0	329.80	17.5	20.0	4.0	9.5	0.5	6.5	13°	0.20
H-D0E3000	3	300.0	330.0	41.0	338.0	337.0	315.0	335.80	19.0	21.5	4.0	9.5	0.5	6.5	13°	0.20

H-DOA3010	3	301.0	328.0	38.0	333.0	332.1	315.1	331.15	18.4	20.3	3.7	9.5	0.5	6.3	10°	0.20
H-DOA3090	3	309.0	337.0	40.0	341.0	340.0	325.0	339.10	19.0	21.5	3.1	9.0	0.5	6.5	10	0.20
H-DOA3180	3	318.0	341.0	38.0	351.5	350.5	334.0	349.30	18.0	20.5	3.1	10.0	0.5	6.5	10°	0.20
H-DOB3180	3	318.0	346.0	38.0	351.5	350.5	334.0	349.30	18.0	20.5	3.1	10.0	0.5	6.5	10°	0.20
H-DOC3180	3	318.0	346.0	40.0	351.6	350.7	333.7	349.60	18.5	20.5	3.7	10.0	0.5	6.3	10°	0.13
H-DOA3185	3	318.5	346.4	38.0	351.6	350.7	333.7	349.60	18.4	20.3	3.7	10.0	0.5	6.3	10°	0.20
H-DOA3190	3	319.0	346.0	45.0	351.5	350.5	334.0	349.30	21.5	23.5	3.1	10.0	0.5	6.5	10°	0.20
H-DOB3190	3	319.0	346.5	46.0	351.6	350.7	333.7	349.60	18.4	24.1	3.7	10.0	0.5	6.3	10°	0.20
H-DOA3200	3	320.0	348.0	40.0	354.0	353.0	338.0	351.80	19.0	21.5	3.1	10.0	0.5	6.5	10°	0.20
H-DOA3260	3	326.0	354.0	30.0	358.7	357.7	346.0	357.20	15.0	16.5	2.8	7.5	0.5	5.0	10°	0.20
H-DOA3395	3	339.5	369.0	40.0	374.8	373.8	358.0	372.45	19.0	21.5	3.0	10.0	0.5	4.0	10°	0.20
H-DOA3400	3	340.0	368.0	41.0	375.0	374.0	355.0	372.80	17.0	19.5	3.0	10.0	0.5	4.0	9.5°	0.20
H-DOB3400	3	340.0	368.5	38.0	374.8	373.2	358.0	372.80	19.0	21.5	3.0	9.0	0.5	4.0	10°	0.20
H-DOC3400	3	340.0	370.0	40.0	377.0	376.0	355.0	374.44	19.0	21.5	4.0	10.0	0.5	4.0	13°	0.20
H-DOA3500	3	350.0	375.0	38.0	385.5	384.5	368.0	383.30	17.5	20.5	3.1	10.0	0.5	6.5	10°	0.20
H-DOB3500	3	350.0	376.0	44.0	386.0	385.0	368.0	383.80	20.5	22.5	3.1	10.0	0.5	6.5	10°	0.20
H-DOA3550	3	355.0	375.0	38.0	385.5	384.5	368.0	383.30	17.5	20.5	3.1	10.0	0.5	6.5	10°	0.20
H-DOA3560	3	356.0	381.0	38.0	388.5	387.5	370.0	386.30	17.5	20.5	3.1	10.0	0.5	6.5	10°	0.20
H-DOA3650	3	365.0	394.0	38.0	399.5	398.5	380.0	397.20	17.5	20.0	3.0	9.5	0.5	6.5	11°	0.20
H-DOA3660	3	366.0	394.4	38.0	399.5	398.6	381.0	397.40	17.5	20.5	3.0	9.5	0.5	6.5	10°	0.20
H-DOB3660	6	366.0	394.4	40.0	399.5	398.6	381.0	397.40	17.5	20.5	3.0	9.5	0.5	6.5	10°	0.20
H-DOC3660	3	366.0	394.0	46.0	399.5	398.6	381.0	396.90	21.0	23.5	3.1	11.0	0.5	6.5	10°	0.20
H-DOA3665	3	366.5	394.4	38.0	399.5	398.6	381.7	397.60	18.4	20.3	3.7	9.5	0.5	6.3	10°	0.25
H-DOB3665	6	366.5	394.5	48.0	399.5	398.6	381.7	397.60	18.4	24.1	3.7	9.5	0.5	6.3	10°	0.25
H-DOA3700	3	370.0	398.0	38.0	403.5	402.6	385.0	401.40	17.5	20.5	3.0	9.5	0.5	6.5	10°	0.20
H-DOA3805	3	380.5	405.0	40.0	412.2	410.5	395.0	410.30	19.0	21.5	3.1	9.0	0.5	6.5	10°	0.25
H-DOA3810	3	381.0	405.0	40.8	415.0	414.0	393.0	412.80	19.0	21.5	3.1	10.0	0.5	6.5	10°	0.20
H-DOA3820	6	382.0	405.0	40.0	412.0	411.0	395.0	410.40	17.0	22.0	3.8	9.0	1.1	6.0	10°	0.15
H-DOB3820	3	382.0	410.0	42.0	415.4	414.4	400.0	413.20	19.5	21.5	3.0	9.5	0.5	4.0	10°	0.15
H-DOA3870	3	387.0	415.0	38.0	419.5	418.6	402.0	417.40	17.5	20.0	3.0	9.5	0.5	6.5	10°	0.20
H-DOA3880	3	388.0	415.0	38.0	420.3	419.4	402.0	418.20	17.5	20.5	3.0	9.5	0.5	6.5	10°	0.25
H-DOB3880	3	388.0	416.2	38.0	421.6	420.7	402.0	419.50	17.5	20.5	3.0	9.5	0.5	6.5	10°	0.25
H-DOA4240	3	424.0	454.0	42.0	461.0	460.0	439.0	458.70	20.0	22.5	3.0	9.5	0.5	6.5	11°	0.25
H-DOA4285	3	428.5	454.0	37.0	462.3	461.3	444.6	460.10	18.5	21.0	3.0	9.5	0.5	4.0	10°	0.25

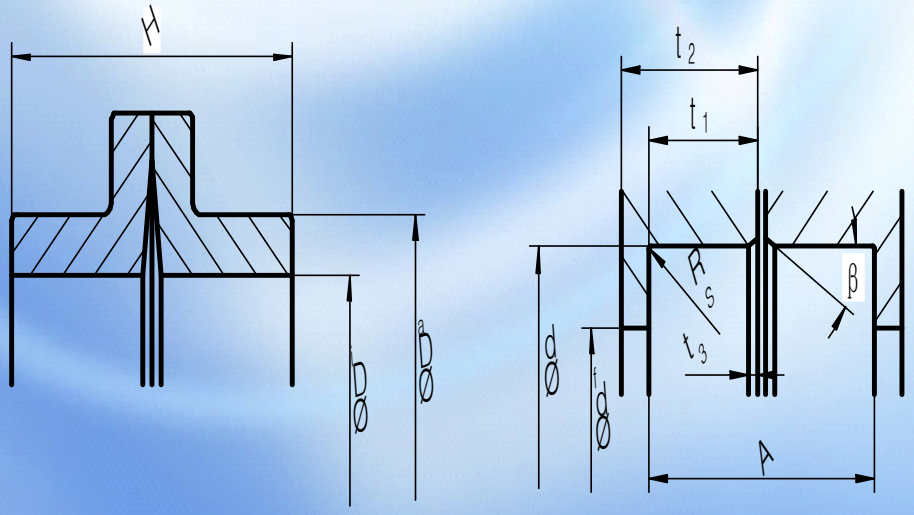
H-DOA4292	3	429.2	457.2	38.0	462.3	461.4	444.4	460.40	18.4	20.3	3.7	9.5	0.5	6.3	10°	0.25
H-DOA4300	3	430.0	457.0	38.0	462.3	461.3	444.0	460.20	17.5	20.5	3.0	9.5	0.5	6.5	10°	0.25
H-DOB4300	3	430.0	458.0	38.0	462.3	461.3	445.0	460.20	17.5	20.0	3.0	9.5	0.5	6.5	10°	0.25
H-DOC4300	3	430.0	459.2	38.0	464.5	463.5	444.0	462.40	17.5	20.5	3.0	9.5	0.5	6.5	10°	0.25
H-DOA4480	3	448.0	482.5	40.0	486.3	485.3	470.0	484.40	19.0	21.5	3.1	9.0	0.5	6.5	10°	0.25
H-DOA4500	3	450.0	480.0	50.0	492.2	490.2	470.0	489.20	23.5	25.5	4.0	13.0	0.5	6.0	10°	0.25
H-DOA4600	16	460.0	494.0	60.0	504.2	503.2	484.0	501.30	23.8	25.2	4.7	13.5	0.5	8.0	10°	0.40
H-DOA4650	3	465.0	495.0	43.6	500.7	498.5	482.9	498.90	21.2	22.9	4.7	10.5	0.7	7.0	10°	0.25
H-DOB4650	3	465.0	497.2	43.6	503.1	500.9	482.9	501.30	21.2	23.0	4.7	10.5	0.7	7.0	10°	0.25
H-DOA4700	3	470.0	500.0	50.0	512.2	510.2	490.0	509.20	23.5	25.5	4.0	13.0	0.5	6.0	10°	0.25
H-DOA5050	6	505.0	533.4	43.6	538.4	537.4	521.0	536.80	19.7	21.7	4.0	9.0	1.3	6.5	10°	0.25
H-DOB5050	3	505.0	534.0	50.0	540.0	538.0	525.0	536.95	21.0	23.5	5.0	13.0	0.5	4.0	10°	0.25
H-DOC5050	3	505.0	535.8	43.6	541.8	539.7	521.0	540.30	19.7	21.7	4.2	9.0	0.5	6.5	10°	0.25
H-DOA5054	6	505.4	533.4	44.0	538.5	537.6	520.6	536.80	21.3	26.2	3.7	9.0	0.5	6.3	10°	0.25
H-DOA5080	15	508.0	548.0	60.0	553.0	551.5	528.0	550.50	22.0	26.0	5.0	13.0	1.1	9.0	10°	0.40
H-DOA5300	3	530.0	560.0	50.0	572.2	570.2	545.0	569.20	23.5	25.5	4.0	13.0	0.5	6.0	10°	0.25
H-DOA5380	6	538.0	566.8	43.6	572.2	571.2	554.0	570.60	19.7	21.7	4.0	9.0	1.3	6.5	10°	0.25
H-DOA5590	3	559.0	590.0	50.0	602.2	600.2	575.0	599.20	23.5	25.5	4.0	13.0	0.5	6.0	10°	0.40
H-DOA5760	6	576.0	608.0	43.6	613.0	612.0	596.0	611.40	19.7	21.7	4.0	9.0	1.3	6.5	10°	0.25
H-DOA5800	3	580.0	608.0	43.6	613.2	612.2	594.0	611.20	20.8	23.8	4.0	9.0	0.5	6.5	13°	0.25
H-DOA5815	6	581.5	608.0	43.6	613.0	612.0	596.0	611.40	19.7	21.7	4.0	9.0	1.3	6.5	10°	0.25
H-DOA5910	5.25	591.0	623.0	50.0	635.2	633.2	613.0	632.20	23.5	25.5	4.0	13.0	0.5	6.0	10°	0.40
H-DOA5960	5.25	596.0	628.0	50.0	640.2	638.2	618.0	637.20	23.5	25.5	4.0	13.0	0.5	6.0	10°	0.40
H-DOA6200	5.25	620.0	650.0	50.0	662.2	660.2	640.0	659.20	23.5	25.5	4.0	13.0	0.5	6.0	10°	0.40
H-DOA6600	13	660.0	695.0	53.0	705.3	703.3	680.0	703.20	20.0	22.5	4.0	10.5	0.5	6.0	10°	0.40
H-DOA6670	9	667.0	700.0	43.6	705.6	704.3	687.0	703.20	21.3	24.0	3.7	11.0	0.7	6.3	10°	0.25
H-DOB6670	9	667.0	700.0	44.0	705.6	704.6	687.6	703.20	18.4	23.4	3.7	11.0	0.5	6.3	10°	0.25
H-DOC6670	12	667.0	700.0	50.0	705.6	704.7	687.7	703.20	21.3	26.2	3.7	11.0	1.2	6.3	10°	0.13
H-DOA7100	3	710.0	750.0	50.0	762.2	760.2	740.0	759.20	23.5	25.5	4.0	13.0	0.5	6.0	10°	0.40
H-DOA7180	3	718.0	750.0	50.0	762.2	760.2	740.0	759.20	23.5	25.5	4.0	13.0	0.5	6.0	10°	0.40
H-DOA7380	3	738.0	770.0	50.0	782.2	780.2	760.0	779.20	23.5	25.5	4.0	13.0	0.5	6.0	10°	0.40
H-DOA7400	17	740.0	801.0	80.0	816.9	815.9	784.0	812.80	34.5	39.5	4.4	17.0	1.1	10.0	10°	0.40
H-DOA7700	17	770.0	826.0	80.0	831.9	830.9	800.0	827.80	34.5	39.5	4.4	17.0	1.1	10.0	10°	0.40
H-DOA7800	17	780.0	836.0	80.0	841.9	840.9	810.0	837.80	34.5	39.5	4.4	17.0	1.1	10.0	10°	0.40

技术指导 *Technical guidance*

结构 *Construction*

DF 型浮动油封座腔的设计和加工简单，腔体空间更大，加工尺寸较少。这种经济的设计降低了农业机械和矿山机械的生产成本。DF 型浮动油封可以承受比 DO 型更大的压力，由两个翼型的橡胶件和两个金属密封环组成。

The DF type floating seal allows for a simpler housing design and construction. The housing is easier to machine , but more housing space is required and fewer tooled sizes are available. This economy of design provides reduced manufacturing costs in agricultural equipment 、 mine machinery and other field machinery. The seal has a higher pressure capability and range compared to the DO seal. The type DF seal utilizes a unique wing-form elastomeric packing with floating seats made of special alloy cast iron.



DF型 浮动油封规格表

P/N	A	ΦD$_i$	ΦD$_a$	H	Φd	Φd$_f$	t$_1$	t$_2$	t$_3$	Rs	β	±Tolfor
P/N	A	ΦD$_i$	ΦD$_a$	H	Φd	Φd$_f$	t$_1$	t$_2$	t$_3$	Rs	β	+/- Tol fur
H-DFA0420	23.0	42.0	59.0	20.0	65.0	53.0	10.0	10.5	2.0	1.0	15°	0.10
H-DFA0450	24.7	45.0	65.0	22.0	70.1	58.0	11.5	12.1	1.5	1.0	30°	0.06
H-DFA0470	23.0	47.0	62.0	20.0	70.0	58.0	10.0	11.0	2.0	1.0	15°	0.10
H-DFA0485	28.9	48.5	62.5	25.6	76.3	62.9	13.6	14.0	1.6	1.0	30°	0.10
H-DFA0505	22.5	50.5	65.0	19.0	76.2	63.0	10.0	11.0	2.0	1.0	15°	0.10
H-DFA0540	26.0	54.0	73.0	22.0	80.0	67.0	11.5	12.0	1.5	1.0	15°	0.10
H-DFA0560	22.9	56.0	76.0	21.0	82.6	70.1	10.6	11.7	1.0	1.0	30°	0.10
H-DFA0580	23.0	58.0	78.0	20.0	82.6	65.0	10.0	11.0	1.5	1.0	30°	0.10
H-DFA0585	23.0	58.5	73.0	19.0	82.5	65.0	10.0	11.0	2.0	1.0	15°	0.10
H-DFA0586	21.0	58.6	80.0	19.6	84.0	71.0	9.0	9.5	1.5	1.0	15°	0.10
H-DFA0600	28.0	60.0	80.0	24.0	85.0	70.0	10.5	10.5	1.0	1.0	30°	0.06
H-DFA0635	21.0	63.5	81.0	19.0	87.8	71.0	9.0	9.5	1.0	1.0	15°	0.10
H-DFA0670	23.0	67.0	86.2	20.0	95.4	82.0	10.0	11.0	2.0	1.0	15°	0.10
H-DFB0670	29.0	67.0	87.0	25.0	95.0	81.0	12.5	13.0	1.5	1.0	15°	0.10
H-DFC0670	23.0	67.0	91.7	20.0	95.4	82.0	10.0	11.0	2.0	1.0	15°	0.10
H-DFA0680	23.5	68.0	86.2	20.0	95.6	82.0	10.0	11.0	2.0	1.0	15°	0.10
H-DFA0735	23.3	73.5	93.0	20.0	102.4	88.4	10.8	11.2	1.0	1.0	30°	0.10
H-DFA0738	23.0	73.8	92.8	20.0	102.2	88.0	10.0	11.0	2.0	1.0	15°	0.10
H-DFA0740	23.0	74.0	99.0	20.0	102.2	88.0	10.0	11.0	2.0	1.0	15°	0.10
H-DFA0760	18.0	76.0	90.0	17.0	95.0	83.0	8.0	9.5	1.0	1.0	30°	0.06
H-DFA0770	29.0	77.0	97.0	25.0	105.0	87.0	12.5	13.5	1.5	1.0	15°	0.10
H-DFA0817	23.0	81.7	101.5	20.0	110.2	96.0	10.0	11.0	2.0	1.0	15°	0.10
H-DFA0825	25.5	82.5	100.0	22.0	114.3	97.0	11.0	12.0	2.0	1.0	15°	0.10
H-DFA0875	20.0	87.5	109.0	17.5	113.0	100.0	8.5	9.5	1.5	1.0	15°	0.10
H-DFB0875	23.0	87.5	111.5	19.0	115.8	102.0	10.0	11.0	1.5	1.0	15°	0.10
H-DFA0880	20.0	88.0	104.0	19.0	113.0	98.0	8.0	9.5	1.0	1.0	20°	0.06
H-DFA0920	28.0	92.0	113.0	24.0	125.8	109.0	12.5	13.0	2.5	1.0	15°	0.10
H-DFA0940	28.0	94.0	112.5	24.0	125.8	109.0	12.5	13.0	2.5	1.0	15°	0.10
H-DFB0940	28.0	94.0	120.0	24.0	125.8	109.0	12.5	13.0	1.5	1.0	30°	0.10

H-DFC0940	27.8	94.0	120.0	25.0	125.8	109.1	13.0	13.6	1.5	1.0	30°	0.10
H-DFA0990	20.0	99.0	120.0	17.5	124.0	110.0	8.5	9.5	1.5	1.0	15°	0.10
H-DFB0990	23.0	99.0	123.0	19.0	127.3	113.0	10.0	11.0	3.0	1.0	15°	0.10
H-DFA1040	28.0	104.0	126.0	24.0	135.0	114.0	12.0	13.0	2.0	1.0	15°	0.10
H-DFB1040	33.0	104.0	132.0	27.0	141.2	120.0	15.0	16.0	1.5	1.0	30°	0.10
H-DFA1050	27.0	105.0	124.0	24.4	135.0	114.0	12.0	13.0	2.0	1.0	15°	0.10
H-DFA1075	17.0	107.5	123.0	15.0	127.5	105.0	7.5	8.5	1.5	1.0	30°	0.10
H-DFA1140	28.0	114.0	133.2	26.0	148.0	130.0	12.0	13.0	2.0	1.0	15°	0.10
H-DFB1140	28.0	114.0	138.0	26.0	148.0	126.0	12.0	13.0	2.0	1.0	15°	0.10
H-DFA1150	33.5	115.0	141.0	28.0	152.4	131.4	15.9	15.9	1.5	1.0	30°	0.10
H-DFA1240	40.0	124.0	144.0	32.0	162.5	142.0	18.5	20.5	1.5	1.0	15°	0.10
H-DFA1320	34.0	132.0	158.0	31.0	171.5	151.8	15.4	15.9	1.5	1.5	30°	0.10
H-DFA1330	32.5	133.0	156.0	28.0	171.5	151.0	13.0	14.0	2.0	1.0	15°	0.10
H-DFA1425	27.7	142.5	161.0	24.0	173.0	139.7	11.1	11.3	1.5	1.0	30°	0.10
H-DFA1430	33.6	143.0	165.0	28.0	177.5	168.0	15.8	16.8	1.5	1.0	30°	0.10
H-DFA1480	34.7	148.0	172.0	29.0	184.5	164.7	16.5	16.5	1.5	1.5	30°	0.10
H-DFA1485	38.0	148.5	168.0	32.4	184.1	164.0	16.5	17.5	1.5	1.0	15°	0.10
H-DFA1500	35.0	150.0	175.0	30.0	190.0	170.0	15.0	15.5	2.0	1.0	15°	0.15
H-DFA1540	41.3	154.0	180.0	36.0	194.0	174.0	18.4	20.0	1.4	1.0	15°	0.15
H-DFA1580	22.0	158.0	180.0	18.0	190.0	174.0	8.0	10.0	1.0	1.0	15°	0.10
H-DFA1690	24.0	169.0	189.0	22.0	199.0	185.0	11.0	12.0	1.5	1.0	30°	0.15
H-DFB1690	35.2	169.0	195.0	33.0	206.2	191.5	15.1	18.4	1.1	1.0	15°	0.15
H-DFA1780	32.0	178.0	207.0	29.0	218.9	197.0	15.0	16.5	1.5	1.0	30°	0.15
H-DFA1920	32.2	192.0	218.0	32.0	231.0	206.0	15.2	17.1	1.0	1.5	30°	0.10
H-DFA1930	41.8	193.0	214.3	31.0	238.9	215.0	19.4	20.4	1.4	1.0	15°	0.15
H-DFB1930	41.8	193.0	223.0	34.0	238.7	215.0	19.4	20.4	1.5	1.0	30°	0.15
H-DFA1980	23.0	198.0	220.0	18.0	228.6	212.0	10.5	12.0	1.5	1.0	30°	0.15
H-DFB1980	40.0	198.0	224.0	35.0	245.0	223.0	17.0	17.5	2.0	1.0	15°	0.15
H-DFA2010	44.5	201.0	238.0	36.0	254.0	235.5	21.2	21.2	1.0	1.5	30°	0.20
H-DFA2040	44.4	204.0	234.0	37.0	254.0	226.3	21.2	23.0	1.5	1.0	30°	0.15
H-DFA2135	32.0	213.5	238.0	27.4	254.0	240.0	13.7	13.7	1.5	1.0	30°	0.15
H-DFA2250	48.9	225.0	265.0	40.0	277.1	247.8	23.7	23.7	1.5	1.5	30°	0.15
H-DFA2260	49.0	226.0	256.0	40.0	277.0	247.0	23.0	24.8	1.5	1.0	30°	0.15
H-DFA2280	51.0	228.0	260.5	41.0	277.1	247.5	23.5	24.5	1.5	1.0	15°	0.15

H-DFA2330	40.0	233.0	259.0	35.0	280.0	250.0	17.0	18.0	2.0	1.0	15°	0.15
H-DFA2357	33.8	235.7	265.0	30.0	273.1	230.0	15.6	15.7	1.5	1.0	30°	0.10
H-DFA2360	34.2	236.0	265.0	30.0	273.1	230.0	15.6	17.0	1.5	1.0	30°	0.15
H-DFA2390	36.5	239.0	264.0	34.0	279.4	261.9	17.5	18.2	1.6	1.0	45°	0.15
H-DFA2410	37.0	241.0	273.0	36.0	279.4	260.6	17.5	20.0	1.5	1.0	30°	0.15
H-DFA2415	37.0	241.5	273.5	36.0	279.4	260.6	17.5	20.0	1.0	1.0	15°	0.15
H-DFA2470	49.5	247.0	270.5	41.0	301.2	272.0	23.5	23.5	1.5	1.0	30°	0.15
H-DFA2560	32.8	256.0	282.0	30.0	292.1	276.2	15.6	16.2	1.5	1.0	30°	0.10
H-DFA2750	37.0	275.0	303.0	36.0	309.4	290.0	17.5	20.0	1.0	1.0	15°	0.20
H-DFA2830	40.0	283.0	305.0	42.0	329.4	307.0	18.5	22.1	1.5	1.0	15°	0.20
H-DFB2830	39.1	283.0	319.0	34.0	329.4	307.3	18.5	18.5	1.5	1.0	45°	0.15
H-DFA3020	33.2	302.0	330.0	28.0	336.6	317.0	15.6	17.0	1.5	1.0	30°	0.20
H-DFA3190	42.0	319.0	353.0	36.2	365.1	343.0	20.0	22.0	1.5	1.0	30°	0.20
H-DFB3190	42.1	319.0	353.0	36.0	365.1	343.7	20.0	20.0	1.6	1.5	30°	0.15
H-DFA3200	42.0	320.0	352.5	40.0	365.1	343.0	20.0	21.5	1.5	1.0	15°	0.20
H-DFA3540	47.6	354.0	392.0	38.0	401.7	380.0	23.0	25.0	1.5	1.0	15°	0.25
H-DFA3550	47.6	355.0	391.8	42.0	401.7	380.0	23.0	25.0	1.5	1.0	15°	0.25
H-DFB3550	47.8	355.0	392.0	39.6	401.7	380.0	23.0	24.0	1.5	1.0	15°	0.25
H-DFA3790	47.6	379.0	414.0	40.0	424.1	403.0	23.0	25.0	1.5	1.0	15°	0.25
H-DFA4290	39.8	429.0	458.0	40.0	477.0	447.0	18.4	22.0	1.5	1.0	30°	0.25
H-DFA4420	39.3	442.0	470.0	41.0	488.7	467.0	18.4	22.0	1.4	1.0	30°	0.25
H-DFA4800	48.0	480.0	515.0	44.0	530.0	502.0	22.0	24.8	1.5	1.0	30°	0.25
H-DFA4920	41.8	492.0	530.0	43.0	546.1	532.0	19.9	24.4	1.5	1.0	15°	0.25
H-DFA5000	41.8	500.0	534.0	42.0	546.1	532.0	19.9	24.4	1.5	1.0	15°	0.25
H-DFA5350	53.0	535.0	580.0	45.0	600.0	581.0	24.5	28.3	1.5	1.0	30°	0.25
H-DFA5700	51.0	570.0	600.0	45.0	615.0	585.0	23.5	27.3	1.5	1.0	30°	0.25
H-DFA6170	54.0	617.0	670.0	52.0	682.5	649.0	26.0	28.0	1.5	1.0	30°	0.25
H-DFA6200	54.0	620.0	664.0	46.0	682.5	649.0	26.0	28.0	1.5	1.0	30°	0.25
H-DFA7500	54.0	750.0	780.0	46.0	812.8	779.0	26.0	28.0	1.5	1.0	30°	0.25

恒庆机械

引领行业风范

浮动油封

HQJX



天津市恒庆机械有限公司

地址：天津市新技术产业园区北辰女子科技园
邮编：300402
公司销售部
地址：天津市武清区京津时尚广场6-1102
邮编：301700
电话：022-26999052 26990905
传真：022-26990905
网址：www.hqjxco.com

TIANJIN HENGQING MACHINERY COMPANY LTD.

ADDRESS: TIANJIN BEICHEN HI-TECH INDUSTRIAL PARK,TIANJIN,CHINA
SALES DEPARTMENT
ADDRESS:6-1102 FASHION PLAZA,WUQING DISTRICT,
TIANJIN,CHINA P.C:301700
TEL: 022-26999052 26990905
FAX: 022-26990905 P.C:300402
Http: www.hqjxco.com

天津市恒庆机械有限公司
TIANJIN HENGQING MACHINERY COMPANY LTD.