

| ANSI/APSP/ICC-15 ENERGY EFFICIENCY COMPLIANCE INFORMATION FOR RESIDENTIAL SWIMMING POOLS |                   |                                 |       |
|--|-------------------|---------------------------------|-------|
| PROJECT NAME:<br>AND ADDRESS   |                   | CONTRACTOR NAME<br>AND ADDRESS: |       |
|  |                   |                                 |       |
|  |                   |                                 |       |
| OWNER:   | CONTRACTOR PHONE: |                                 | DATE: |

This information sheet was prepared by the APSP-15 Residential Swimming Pool and Spa Energy Efficiency Standard Writing Committee (SWC) of the Pool & Hot Tub Alliance (PHTA). It is not part of the American National Standard ANSI/APSP/ICC-15 2011 but is included for information only.

**1. §5.2.1: Calculated pool volume**

- a. Gallons: \_\_\_\_\_; or  
 b. *Calculated Gallons:* \_\_\_\_\_ (surface area) X \_\_\_\_\_ (average depth) X 7.48 (gal/ft<sup>3</sup>) = \_\_\_\_\_

**2. §5.2.1: Calculated filtration flow rate**

(Pool volume ÷ 360 or 36gpm whichever is larger)

**3. §5.5.1: Pipe sizing:**

**a. Minimum suction pipe diameter**

(Enter the smallest pipe size from Table 1 with a 6 fps flow capacity the same or more than item 2.)

**b. Minimum suction branch pipe diameter**

(Calculate: Item 2. \_\_\_\_\_ (gpm) ÷ Branch Pipes \_\_\_\_\_ (quantity) = branch flow rate \_\_\_\_\_ (gpm). Enter the smallest pipe size from Table 1 with a 6 fps flow capacity the same or more than the calculated suction branch flow rate.)

**c. Minimum return pipe diameter**

(Enter the smallest pipe size from Table 1 with a 8 fps flow capacity the same or more than item 2.)

**d. Minimum return branch pipe diameter**

(Calculate: Item 2. \_\_\_\_\_ (gpm) ÷ Branch Pipes \_\_\_\_\_ (quantity) = branch flow rate \_\_\_\_\_ (gpm). Enter the smallest pipe size from Table 1 with a 8 fps flow capacity the same or more than the calculated return branch flow rate.)

**4. §5.4.1: Filter type and size:**

**a. Filter type:** (Cartridge, DE, Sand)

**b. Minimum filter area**

(Calculate: item 2. \_\_\_\_\_ (gpm) ÷ filter factor \_\_\_\_\_ (gpm/ft<sup>2</sup>))  
 Filter factors: Cartridge=0.375, Sand=15, Diatomaceous Earth=2

**5. §5.4.2: Backwash valve:** \_\_\_ Yes, \_\_\_ No

(When using a backwash valve, enter result of item 3c or 2 inches whichever is larger)

**Table 1**

| Schd 40 Pipe Size | 1" | 1.5" | 2" | 2.5" | 3"  | 4"  | 5"  | 6"  | 8"    | 10"   | 12"   |
|-------------------|----|------|----|------|-----|-----|-----|-----|-------|-------|-------|
| GPM @ 6 fps       | 16 | 38   | 63 | 89   | 138 | 238 | 374 | 540 | 935   | 1,474 | 2,092 |
| GPM @ 8 fps       | 22 | 51   | 84 | 119  | 184 | 317 | 499 | 720 | 1,247 | 1,965 | 2,790 |

**6. Single-speed pump selection (when used):**

§5.1.1, 5.3.1: For single-speed pumps with a total horsepower 0.99 or less, find and enter a compliant pump from the Pool Pump Database.

**a. Pump model**

**b. Total horsepower**

**7. Multi-speed pump selection (when used):**

§5.3.2.1: Pools 17,000 gallons or less, select pump\* from the database with a Curve A gpm flow equal to item 2 or less.

§5.3.2.2: Pools 17,001 gallons or more, select pump\* from the database with a Curve C gpm flow equal to item 2 or less.

\*Multi-speed pumps must have one speed listed that satisfies this requirement.

**a. Pump model**

**b. Pump flow**

(§5.3.2.1, §5.3.2.2: Applicable Curve A or C gpm flow listed in database)

1. \_\_\_\_\_ gallons \_\_\_\_\_

2. \_\_\_\_\_ gpm \_\_\_\_\_

3a. \_\_\_\_\_ inches \_\_\_\_\_

3b. \_\_\_\_\_ inches \_\_\_\_\_

3c. \_\_\_\_\_ inches \_\_\_\_\_

3d. \_\_\_\_\_ inches \_\_\_\_\_

4a. \_\_\_\_\_ \_\_\_\_\_

4b. \_\_\_\_\_ sq. ft. \_\_\_\_\_

5. \_\_\_\_\_ inches \_\_\_\_\_

(When used)

6a. \_\_\_\_\_ \_\_\_\_\_

6b. \_\_\_\_\_ \_\_\_\_\_

or

7a. \_\_\_\_\_ \_\_\_\_\_

7b. \_\_\_\_\_ gpm \_\_\_\_\_

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| Component    | Section | Requirements   | Check |
|--------------|---------|--|-------|
| Heaters      | 4.4.1.1 | Heater has no pilot light.   |       |
|              | 4.4.1.2 | Readily accessible on-off switch mounted outside of the heater.  |       |
|              | 4.3.1.3 | No electric resistance heating unless for inground spa with tight fitting cover with R-6 insulation, or for pool with 60% of documented pool heating from on-site solar or recovered energy.   |       |
|              | 4.3.2   | Heater efficiency: gas/oil-fired heater efficiency at least 82%, heat pump COP at least 4.0.   |       |
| Pool systems | 5.1.1   | Pool filter pump listed in database.   |       |
|              | 5.3.1   | Pool filter pump with total horsepower 1.0 or more is multi-speed.   |       |
|              | 5.3.3   | Multi-speed pump controller programmed to default to the filtration flow rate when no auxiliary pool loads are operating within 24 hours and programmed with temporary override capability for servicing.  |       |
|              | 5.3.4   | Single-speed pump controller capable of operating pump during off-peak electric demand.  |       |
|              | 5.5.2   | Pipe before pump has at least 4 diameters of straight pipe.  |       |
|              | 5.5.3   | System installed with solar, or setup for the future addition of solar heating equipment by installing 18 inches of horizontal or vertical pipe after the filter and before a heater, or built-in or built-up connections, or dedicated pipe to and from the pool. |       |
|              | 5.6     | Directional inlets for mixing pool water.  |       |

## Worksheet Summary

## Document the Maximum Auxiliary Flow Rate

Complete this form for residential swimming pool filtration pumps that are also used for auxiliary water features such as spas, water features, vanishing edges, cleaning systems, etc. The maximum auxiliary flow rate must be provided to calculate the minimum recirculation system pipe size. This calculator uses 8 feet per second (fps), the maximum flow velocity allowed in residential pool piping, fittings, valves, skimmers, and main drain sump fittings. Skimmer and main drain pipe must be sized to handle 100% of the auxiliary flow rate.

**Auxiliary GPM:**

**Step 1:** Enter the Auxiliary GPM. This is the flow rate needed to operate the auxiliary feature(s).

**Calculated Pipe Size:**

**Step 2:** Use the Calculated Pipe Size in the TDH Calculator. Enter the length of pipe (in feet), the quantity of fittings, 3-Way Valves, equipment, and any additional component losses.

## Total Dynamic Head (TDH) Calculator

| PIPE | SIZE | Suction Side Loss at 8 fps |      | Return Side Loss at 8 fps |      |
|------|------|----------------------------|------|---------------------------|------|
|      |      | QTY                        | LOSS | QTY                       | LOSS |
|      |      |                            |      |                           |      |

| 90 ELL | SIZE | Suction Side Losses |      | Return Side Losses |      |
|--------|------|---------------------|------|--------------------|------|
|        |      | QTY                 | LOSS | QTY                | LOSS |
|        |      |                     |      |                    |      |

| TEE | SIZE | Suction Side Velocity |      | Return Side Velocity |      |
|-----|------|-----------------------|------|----------------------|------|
|     |      | QTY                   | LOSS | QTY                  | LOSS |
|     |      |                       |      |                      |      |

| 45 ELL | SIZE | Suction Side Velocity |      | Return Side Velocity |      |
|--------|------|-----------------------|------|----------------------|------|
|        |      | QTY                   | LOSS | QTY                  | LOSS |
|        |      |                       |      |                      |      |

| Suction Side Loss |      |      |     | Return Side Loss |      |      |  |
|-------------------|------|------|-----|------------------|------|------|--|
| 3-WAY VALVE       | SIZE | Each |     | 3-WAY VALVE      | SIZE | Each |  |
| Main Drain        |      | X    | 1.5 |                  |      |      |  |

Provide a copy of the Suction Outlet Fitting Assembly "Cut Sheet" with the documents you provide to the Building Department. Print this form along with all support documents and submit them to the Building Department for permitting.

| Suction Side Summary                                       |  | Return Side Summary                              |  |
|--|--|--|--|
| TDH Suction Side, Pipe, Fittings, Drains, and 3-Way Valves |  | TDH Return Side Pipe, Fittings, and 3-Way Valves |  |

Provide "FLOW LOSS" curves for any equipment to be installed and record those values (in Feet of Head). See samples on page 4.

|                                      |  |                                    |  |   |  |
|--------------------------------------|--|------------------------------------|--|---|--|
| Filter Loss at Auxiliary Flow Rate   |  | Heater Loss at Auxiliary Flow Rate |  | Chlorinator Loss at Auxiliary Flow Rate |  |
| Ozonator Loss at Auxiliary Flow Rate |  | UV Loss at Auxiliary Flow Rate     |  | Additional Component Loss               |  |
| Additional Component Loss            |  | Additional Component Loss          |  | Additional Component Loss               |  |

|                                   |  |
|-----------------------------------|--|
| Total Additional Equipment Losses |  |
|-----------------------------------|--|

|                                  |  |
|----------------------------------|--|
| <b>Total Calculated Pool TDH</b> |  |
|----------------------------------|--|

|                                |  |                  |
|--------------------------------|--|------------------|
| Maximum Auxiliary Flow Rate of |  | Will Be Provided |
|--------------------------------|--|------------------|

The value of the Maximum Auxiliary Flow Rate must be equal to or greater than the Maximum Flow Rate of your Suction Outlet(s).

**Step 3:** Use the manufacturer's full-speed pump curve (typically 3450 rpm) and apply the Total Dynamic Head Loss that was calculated and apply that value to the curve to determine your maximum flow rate. That flow cannot exceed the maximum allowable flow rate of the Suction Outlet Fitting Assembly (SOFA).

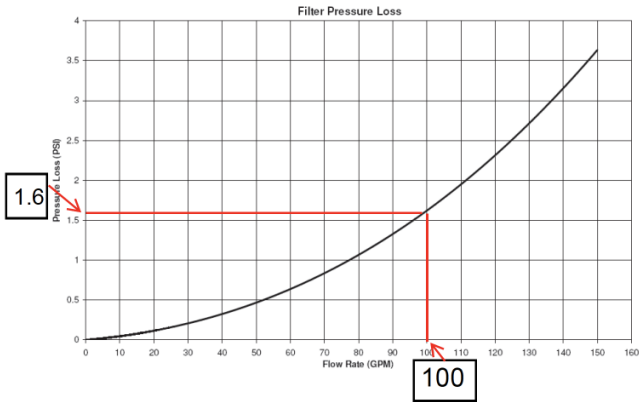
Print this form along with all support documents and submit them to the Building Department for permitting.

# Examples of Equipment Loss Curves and Pump Loss Curves

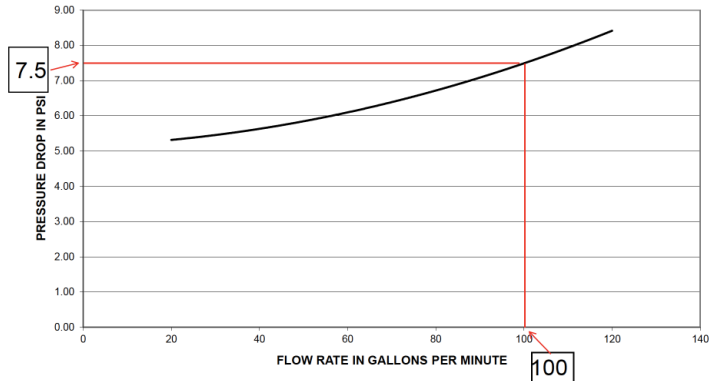
Provide head loss documentation for every piece of installed equipment that residential swimming pool filtration water flows through. Addresses items in the following PHTA standards:

- ANSI/APSP/ICC-5 2011 American National Standard for Residential Inground Swimming Pools [https://issuu.com/thepta/docs/apsp-5\\_2011\\_includes\\_addenda\\_a\\_approved\\_062812](https://issuu.com/thepta/docs/apsp-5_2011_includes_addenda_a_approved_062812)
- ANSI/APSP/ICC-7 2013 American National Standard for Suction Entrapment Avoidance in Swimming Pools, Wading Pools, Spas, Hot Tubs And Catch Basins [https://issuu.com/thepta/docs/apsp-7\\_2013](https://issuu.com/thepta/docs/apsp-7_2013)

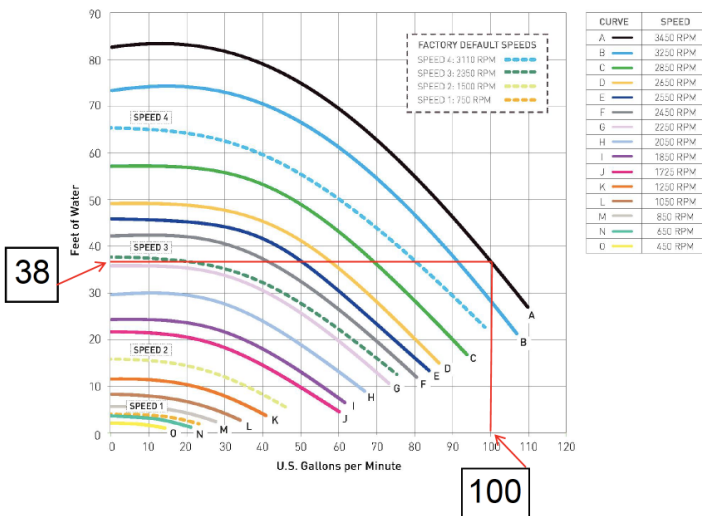
**Filter Loss Sheet**



**Heater Loss Sheet**



**Pump Curve - Use Full Speed Curve**



**Provide a Cut Sheet on The Suction Outlet You Will Use**

| VGB CERTIFIED SPECIFICATIONS   | Floor Flow Rating<br>316 GPM at 3.9 fps | Wall Flow Rating<br>208 GPM at 2.6 fps  | Sump Depth<br><i>Use sump included</i> | Open Area<br>25.9 in <sup>2</sup> |
|--|---|---|--|-----------------------------------|
| <b>FEATURES</b><br>All components meet or exceed ANSI/APSP 16-2011 and NSF/ANSI 50 national standards and ASTM G154 UV testing exposure.<br>Three ports: bottom 2 1/2" OD, 2" ID 5/8" inside 2" threaded FPT; two 2" threaded plugs included.<br>Strong PVC sump does not require transitional glue.<br>Disposable plastic pre-quinite/plaster insert keeps debris out and retains sump shape during construction.<br>#316 stainless steel screws.<br>Manufactured from superior UV-resistant engineered polymers.<br>Online product support including downloadable CAD files, General Certificate of Conformity, third party certificate, installation instructions and more.<br>Replace drain cover every five years from the date of installation.<br>4 per case. |   | <b>Unblockable!</b><br>   |  |                                   |
| <b>STANDARD COLORS</b><br>32CDFL101 - White<br>32CDFL102 - Black<br>32CDFL103 - Light Gray<br>32CDFL104 - Blue<br>32CDFL105 - Dark Gray<br>32CDFL108 - Tan<br>Also available as sump only p/n<br>VGB 2008 Compliant  |   | <ol style="list-style-type: none"> <li>32" Three-Port PVC Sump</li> <li>2" Tapered Threaded Pipe Plug, Qty 2</li> <li>Port Divider</li> <li>6 x 1/2" Pan Head Phillips, 316 SS, Qty 4</li> <li>32" Channel Drain Plaster Shield</li> <li>32" Channel Drain Flush Cover</li> <li>10 x 3/4" Flat Head Phillips, 316 SS, Qty 16</li> </ol> Plaster Shield And Screws To Be Removed After Curto/Plaster Application |  |                                   |

This document was developed by the Pool and Hot Tub Alliance (PHTA) in cooperation with the International Code Council (ICC) and is intended to assist industry professionals and inspectors in achieving and verifying compliance with Sections 303 and 310, and related sections of the International Pool and Spa Code (ISPS) with regard to residential inground swimming pools. In issuing and making this document available, the PHTA is not undertaking to render professional or other services for or on behalf of any person or entity. Nor is the PHTA undertaking to perform any duty owed by any person or entity to someone else. The PHTA disclaims liability for any personal injury, property, or other damages of any nature whatsoever, whether special, indirect, consequential, or compensatory, directly or indirectly resulting from the publication of, use of, or reliance on this document. It is not intended to and does not address other essential aspects of the ISPS, which include but are not limited to barriers, dimensions, and exits and entries. Industry professionals should review all relevant provisions in the ISPS before completing construction or renovation.