

API RP 13C Testing and Labeling Procedure

API RP 13C is a new physical testing and labeling procedure for shaker screens. To be API RP 13C compliant, a screen must be tested and labeled in accordance with the new recommended practice. The tests describe a screen without predicting its performance and can be performed anywhere in the world. Internationally, API RP 13C will become ISO 13501.

The lack of commonly accepted screen labeling procedures and great disparity in screen designations throughout the oil and gas drilling industry led to the development of API RP 13C. The new procedure is a revision of the previous API RP 13E, which was based on optical measurements of the screen opening using a microscope and computer analysis. Under API RP 13E, screen designations were based on individual manufacturer test methods, producing inconsistent labeling.

Following a review of labeling practices under API RP 13E, the API standards committee concluded that physical testing would be preferred for screen designations. API RP 13C was then developed as an objective method of describing shaker screens. Two tests were devised: cut point and conductance.

Screen Cut Point Determined by ASTM* Sieves

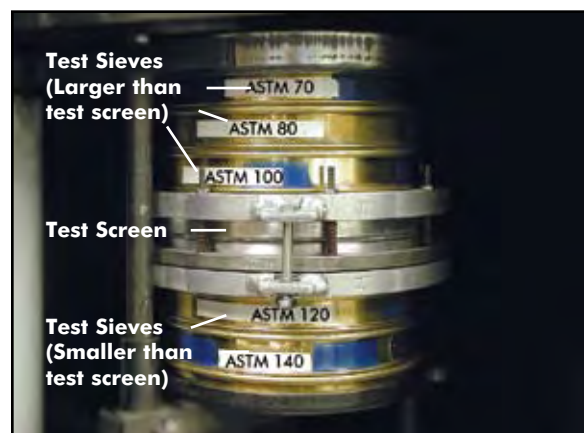
The API RP 13C cut point test is based on a time-proven testing method used by ASTM to classify particles by size. The procedure utilizes a series of standard-size screens (sieves), which have been used for such analysis since 1910. The API standards committee simply adapted the use of these sieves to designating shaker screens. The shaker screen designation is identified by matching the screen's cut point to the closest ASTM sieve cut point.

The cut point test uses aluminum oxide, a Rotap, a set of ASTM sieves, a test screen, and a digital scale for weighing the quantity of test particles retained by the test screen. The D100 cut point is used for assigning screen designations. D100 means that 100 percent of the particles larger than the test screen will be retained, and all finer particles will pass through. After conducting three Rotap tests, the results are averaged, and the screen is given an API number of the test sieve having the closest D100 cut point.

For example:

Using the table below (a section from Table 5 of API RP 13C, pages 40 and 41), the average of three Rotap tests = 114.88 microns. Therefore, the API designation = API 140

D100 Separation (Microns)	API Screen Number
>780,0 to 925,0	API 20
>655,0 to 780,0	API 25
>550,0 to 655,0	API 30
>462,5 to 550,0	API 35
>390,0 to 462,5	API 40
>327,5 to 390,0	API 45
>275,0 to 327,5	API 50
>231,0 to 275,0	API 60
>196,0 to 231,0	API 70
>165,0 to 196,0	API 80
>137,5 to 165,0	API 100
>116,5 to 137,5	API 120
>98,0 to 116,5	API 140
>82,5 to 98,0	API 170
>69,0 to 82,5	API 200
>58,0 to 69,0	API 230
>49,0 to 58,0	API 270
>41,5 to 49,0	API 325
>35,0 to 41,5	API 400
>28,5 to 35,0	API 450
>22,5 to 28,5	API 500
>18,5 to 22,5	API 635



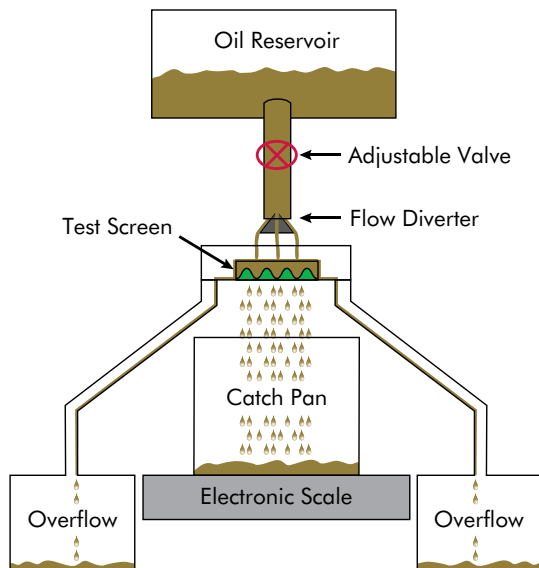
ASTM sieves mounted on Rotap with the test screen in the center. Sieves used for this test range from 70 to 140. Cut point is determined by comparing quantity of test particles trapped by test screen with quantities in ASTM sieves above and below test screen.

* American Society for Testing and Materials

Conductance Test

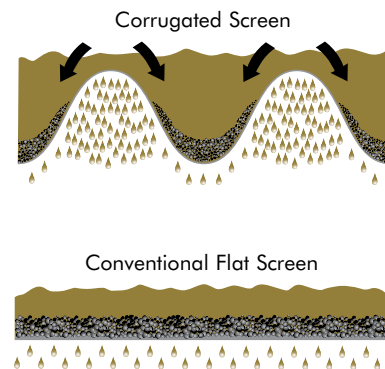
Conductance is a measure of the ability of a fluid to pass through a screen. This property is determined by flowing 5W30 motor oil through a screen sample and then applying the pressure differential to a formula to calculate the conductance. Motor oil was selected because it oil-wets the screen and has a high viscosity. A large volume of motor oil is needed to allow equilibrium and to prevent large temperature changes.

Conductance Test Setup



Screen Shape and Conductance

Corrugated screens have up to 125 percent more surface area than conventional flat screens. Gravity forces the solids into the corrugated screen's troughs, thus allowing more fluid to pass through the top of the screen. With conventional flat screens, conductance is reduced as solids form a continuous bed that impedes fluid flow.



Required Screen Label Information

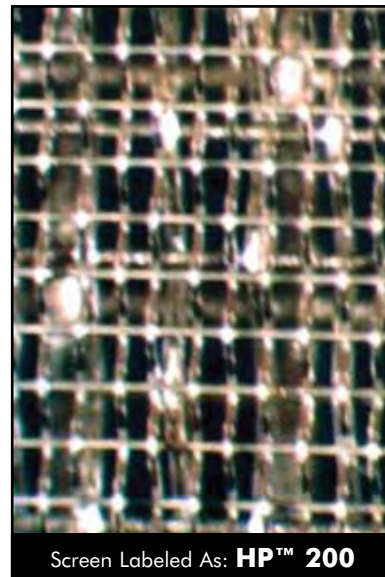
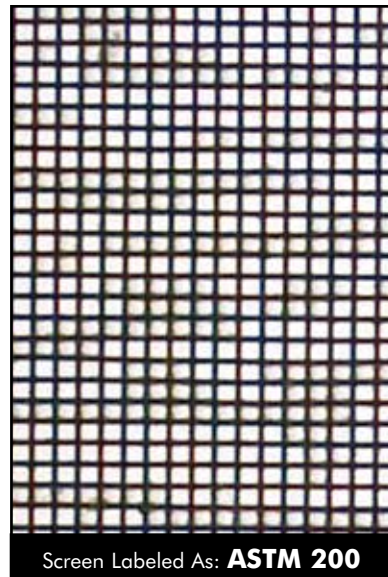
After identifying the cut point and conductance, complying with API RP 13C requires application of a permanent tag or label to the screen in a position that will be both visible and legible. Both cut point expressed as an API number¹ and conductance shown in kD/mm are required on the screen label. Previously, screens were labeled in accordance with manufacturer specifications.

<p>API Designation (micron opening size)</p> <p>Non-blanked Area: xx (ft²) Conductance: yy (kD/mm)</p> <p>Conforms to API 13C</p>	<p>Manufacturer's Name</p> <p>Manufacturer's Designation</p> <p>Country of Manufacturer</p>
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¹The API designation text **MUST** be at least twice the size of any other text on the label.

Independent Lab Test Results

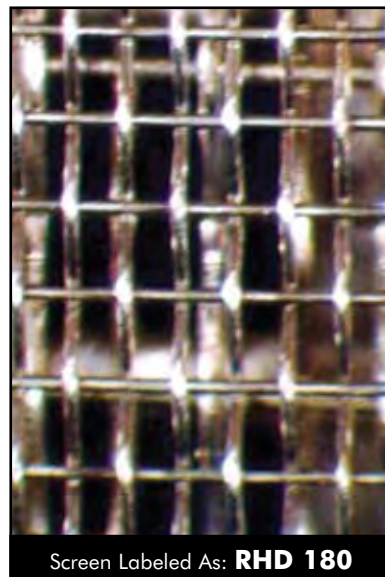
Cut point and conductance were tested on four shaker screens by an independent lab for API's Task Group 5. Compared to an ASTM 200 screen, it is obvious that one screen will have a vastly different cut point than the other. The photographs below are magnified 200x and clearly show that cut points vary significantly among screen manufacturers.



Actual API Screen Number:
API 170 (88 micron)



Actual API Screen Number:
API 80 (173 micron)



Actual API Screen Number:
API 80 (173 micron)



Actual API Screen Number:
API 60 (234 micron)