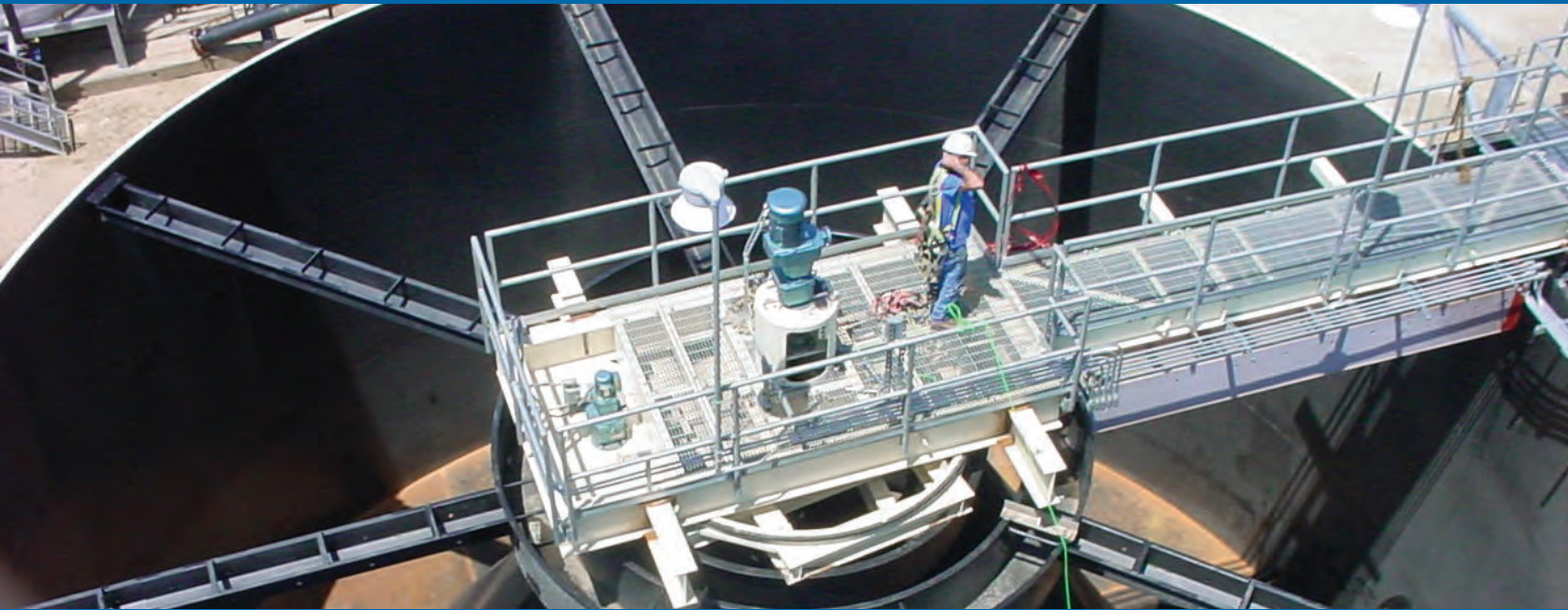


CONTRAFLO[®]

Solids Contact Clarifier



General Filter

WESTECH[®]

CONTRAFLO®

Solids Contact Clarifier

The CONTRAFLO is a true solids contact type clarifier that combines mixing, flocculation, and sedimentation in a single basin. The innovative design was developed by the General Filter Company in the 1950s. Today, as part of WesTech's General Filter family of products, it is still a popular choice for operators and consultants.

CONTRAFLO solids contact clarifiers employ a number of well-established treatment principles, resulting in efficient water treatment. CONTRAFLO clarifiers are capable of solids reduction in a wide variety of applications at relatively high upflow rates. The CONTRAFLO excels in treating surface water and groundwater in such applications as turbidity removal, iron and manganese removal, color removal, and lime/soda ash softening.

The more than 1500 solids contact clarifier installations attest to WesTech's extensive experience and adaptability in applications, sizes, and configurations.



Applications

- **Surface water clarification**
- **Lime softening**
- **Tertiary wastewater treatment for phosphorous reduction**
- **Heavy metals precipitation**
- **Pretreatment to membranes**
- **Pretreatment to conventional filtration**

Features:

- **Low-energy mixing for chemical reactions and formation of floc particles**
- **Gravity sedimentation, clarification, and enhanced flocculation in one unit**

Benefits:

- **Reduced chemical consumption**
- **Low horsepower requirements**
- **Smaller footprint than conventional treatment**
- **Lower installation and operation costs**



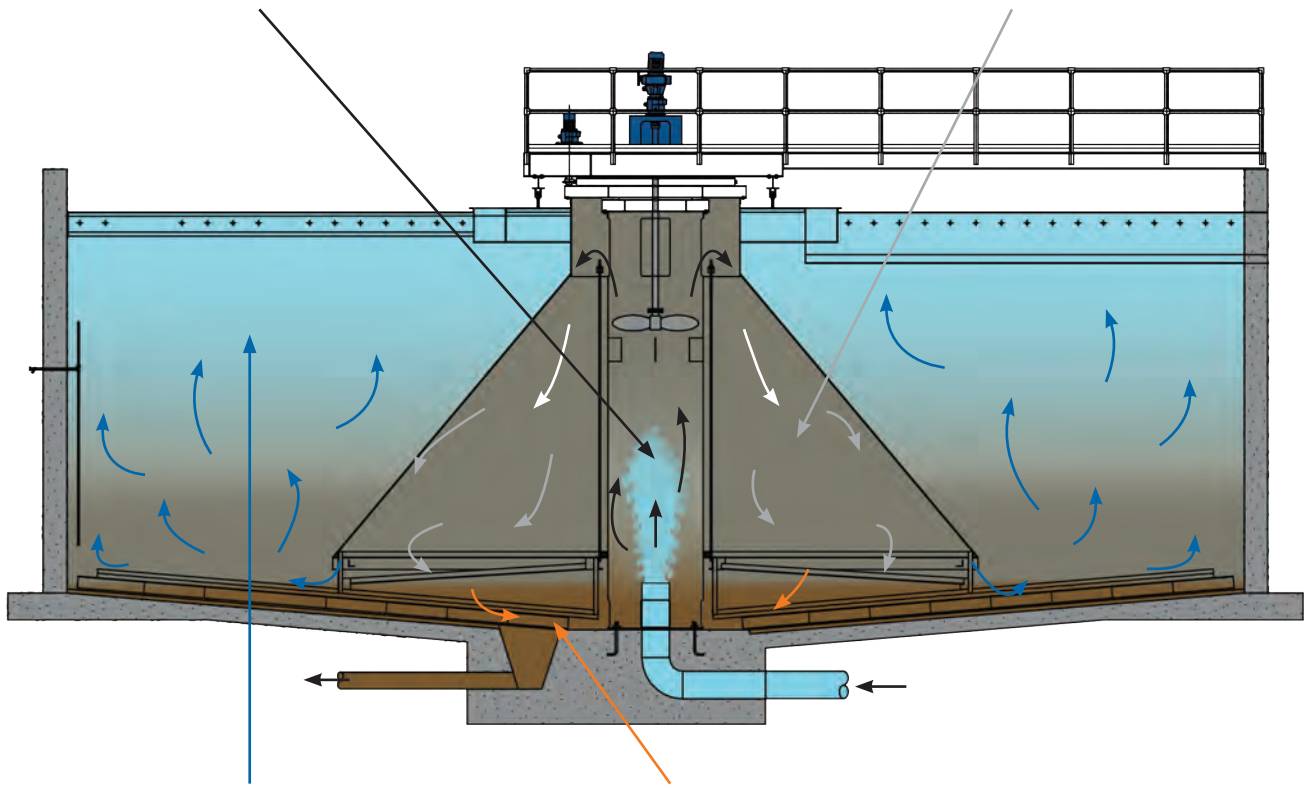
How It Works

Mixing Zone

Raw water and treatment chemicals are mixed with previously formed slurry and precipitated solids. A marine propeller recirculates this flow into the reaction/flocculation zone. Propeller speed is adjustable to attain the optimum recirculation.

Reaction/Flocculation Zone

Flocculation is accelerated here by the contact between reacting chemicals and recirculating precipitated solids. Part of the flow, equal to the raw water rate, is then discharged into the clarification zone, and the remaining flow is recirculated within the mixing zone.



Clarification Zone

The gradually reducing upward velocity of the water maintains a zone of suspended, reacted slurry when operated with a sludge blanket. This acts as a filter and catalyst, enmeshing small particles of sludge. The decreasing velocity is no longer great enough to carry the fine slurry particles, and clarified water escapes toward the effluent launders.

Sludge Removal and Recirculation

Settled solids are scraped to the center of the basin. A portion is removed through the sludge hopper. The remainder of the slurry is recirculated through the draft tube and increases the solids concentration in the flocculation zone and enhances floc formation.

Elements of the CONTRAFLO Solids Contact Clarifier

Launder System

Provides uniform collection of clarified water over the entire clarification zone and transports it out of the basin. Launderers can be radial or peripheral depending on basin size. V-notch weirs or submerged orifices are available.

Clarification Zone

Clarified water rises and solids settle. In some applications, a sludge blanket may be maintained low in this zone to improve clarity by providing low-energy enhanced flocculation.

Sample Lines

Strategically located to allow monitoring of solids inventory.

Scraper Drive

A roller-tooth gear is an efficient, custom-fabricated gear supported by a grease-lubricated locked race bearing.

Mixer Drive

The mixer drive uses an efficient, parallel, helical-gear reducer. Speed variation is provided with a variable frequency drive.

Marine Propeller

A concentric marine-type propeller provides mixing and recirculation. Because of the varying pitch along the entire radius of each blade, the flow velocity is constant across the entire propeller diameter, thereby minimizing floc shear.

Inlet Pipe

Conveys the raw water directly into the draft tube and often provides provisions for injecting and mixing treatment chemicals into the process stream.

Draft Tube

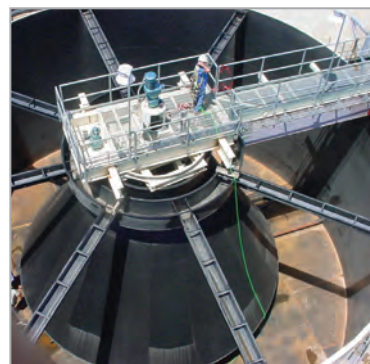
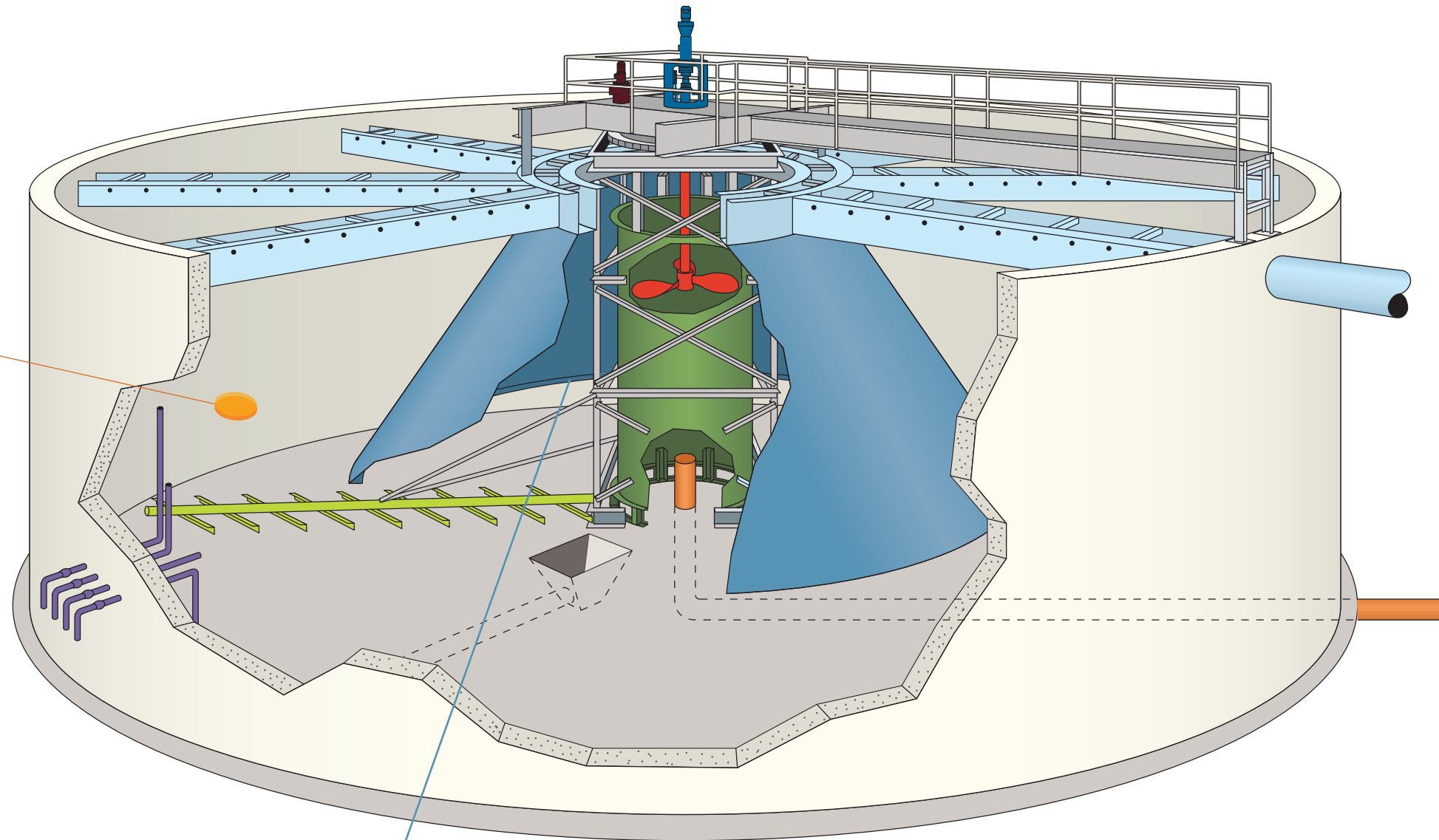
Concentrated solids are lifted from the basin floor and mixed with the inlet flow. The combined streams are then pumped into the Reaction/Flocculation Zone. The draft tube openings extend close to the basin floor, recirculating only the most concentrated solids.

Reaction/Flocculation Zone

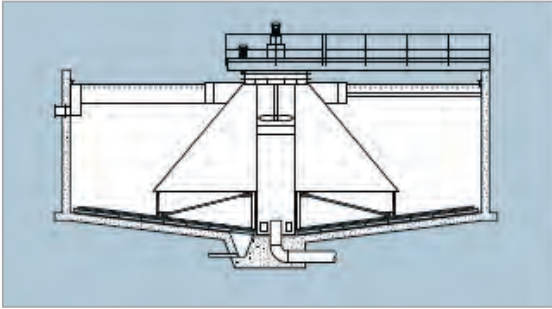
A slow mix zone where chemical precipitation and/or enhanced flocculation occurs. Both conical and cylindrical-shaped reaction wells are available.

Low-Profile Scrapers

Transport settled solids along the basin floor to the draft tube entrance and to the sludge sump.



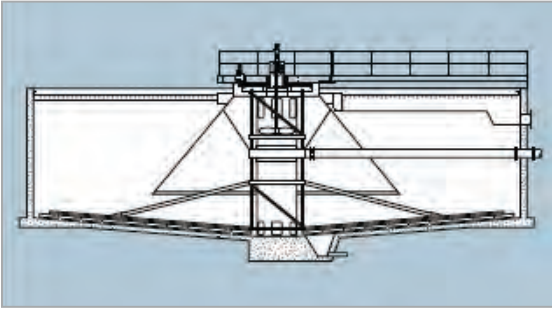
CONTRAFLO Models



Type "C" CONTRAFLO | Model # SCX63 or SCC63

- Column Supported
- Bottom Center Inlet
- Rotating Cone or Cage

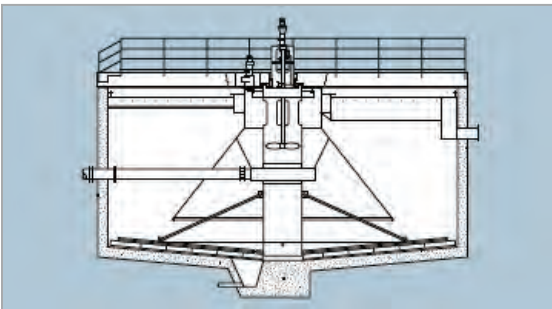
The vast majority of CONTRAFLO units are type "C." Especially compatible for medium-to-large basins, the units utilize a center support pier and bottom inlet feed. A structural drive cage is used to rotate the scraper arms on large units, while the cone drives the scraper on small units.



Type "CCS" CONTRAFLO | Model # SCC73

- Column Supported
- Side Inlet
- Rotating Cage

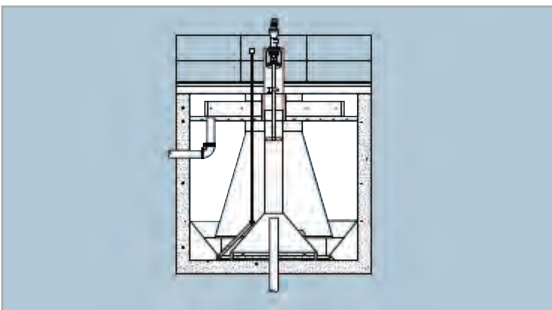
The type "CCS" design is suitable for medium-to-large basins. Raw water is introduced through the side of the basin and ducted into the draft tube via a double muffle ring that allows a transition between rotating and stationary components. A rotating drive cage turns the scraper arms on the pier-supported units.



Type "CS" or "CSS" CONTRAFLO | Model # SCD63 or SCD73

- Bridge Supported
- Bottom Center or Side Inlet
- Rotating Center Column/Draft Tube

The type "CS" and "CSS" designs are bridge supported at the basin walls, and designed for small-to-medium sized basins. The rotating draft tube drives the scraper arms. Raw water inlet is bottom center for the type "CS." For the type "CSS" the inlet enters through the side and connects to the draft tube through a muffle ring.



Type "CT" CONTRAFLO | Model # SCN63 or SCN73

- Bridge Supported
- Bottom Center or Side Inlet
- No Scraper System

The type "CT" design is for smaller basins where sludge scrapers are not required. The mechanism is bridge supported on the basin walls, and the raw water is introduced through either the side or bottom of the basin. Sludge is collected in hoppers positioned around the bottom of the basin.

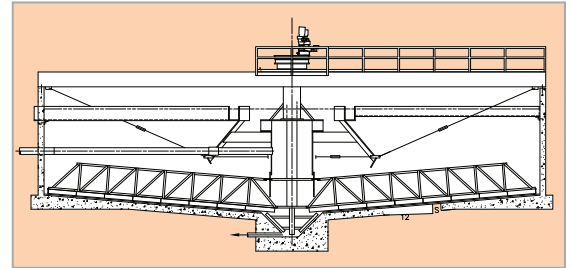
CONTACT CLARIFIER Models

WesTech also offers the CONTACT CLARIFIER™. Developed by WesTech in the 1970s – prior to the acquisition of the General Filter family of products – the CONTACT CLARIFIER has seen extensive use in industrial, mineral, and municipal applications. The independent evolution of these two designs results in a wider array of configurations and a more varied experience base than any other supplier. While the CONTRAFLO and CONTACT CLARIFIER share many similarities, they do feature some distinct mechanical differences.

“Shaft Drive” CONTACT CLARIFIER | Model SCS71

- Bridge Supported
- Side Inlet
- Rotating Shaft

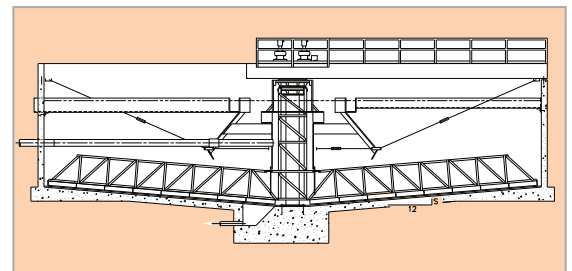
Utilizes a dual shaft drive in a fabricated steel housing. An outer shaft turns the unique curved blade radial flow impeller. Often used in industrial applications, this design can easily incorporate the option for a rake drive lift mechanism.



“Cage Drive” CONTACT CLARIFIER | Model SCC61 or SCC71

- Column Supported
- Bottom Center or Side Inlet
- Rotating Cage

Utilizes a dual cage drive in a fabricated steel housing. This is often the most cost effective option for very large basin diameters.



How do the CONTRAFLO and the CONTACT CLARIFIER systems compare?

CONTRAFLO	<p>Mixer drive</p> <p>Scraper drive</p> <p>Recirculation marine style propeller</p> <p>*Low profile scrapers</p> <p>*Eccentric sludge sump</p> <p>Rakes are driven by a cage, rotating cone, or a draft tube.</p>	<p>Dual drive in steel housing with optional lift</p> <p>Curved blade radial flow impeller</p> <p>*Box truss rake arms</p> <p>*Concentric sludge sump with a scraper</p> <p>Rakes are driven by a shaft or a cage.</p>	CONTACT CLARIFIER
<p>Applications: Identical</p> <p>Process Performance: Identical</p>			

*Indicates the most common configuration. May not always apply to all sizes or models



General Filter



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