



Integrated analysis solutions for successful power projects

Ensuring safe and efficient designs

eBook

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Facing the challenges of power projects

The modern power industry is one of the most challenging industries to operate in. Not only due to the stringent standards that must be adhered to, but also the safety measures that must be taken to ensure reliable operation.

Organizations in this industry are tasked with creating facilities and assets for renewable energy, nuclear, wind or utilities-based operations. However, the owners, operators, EPC firms and engineering organizations tackling these projects consistently struggle to meet deadlines due to a lack of collaboration between various disciplines, departments and solutions involved.

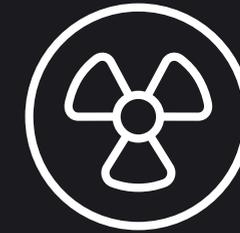
While there are many analysis solutions on the market, engineering efforts using these solutions are often siloed and fractured, preventing opportunities for an efficient and integrated ecosystem. This disconnected approach often leads to miscommunication, bottlenecks, frustration and potential overspending due to the onerous oversight of projects. Safety in the power industry is also paramount, however, collaboration between designers and engineers is often limited, leading to unsafe designs.

How can you avoid pitfalls and achieve faster and more accurate analysis results? Adopt an integrated analysis ecosystem that provides you with the design data you need to streamline workflows, collaborate effectively and deliver on time and within budget.

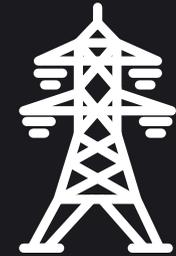


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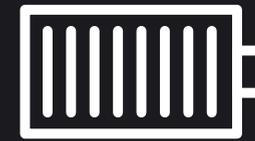
Discover Octave analysis solutions for:



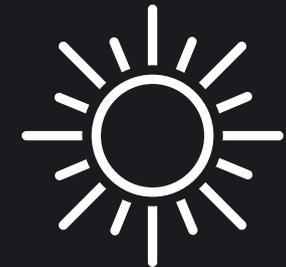
Nuclear power operations



Utilities



Power generation



Solar/thermal power plants



Hydrogen and renewable power



Bio-mass power operations

What can you achieve? Power projects from the ground up

Octave's solutions are built to assist organizations in building power facilities from the ground up. Start with Octave Aspect Structure (formerly GT STRUDL), for designing your initial structural supports for nuclear reactors, tanks and more. Aspect Structure is developed under an NQA quality assurance program while its solvers are routinely audited in ASME/NQA/CFR/EPRI quality assurance programs. Start building your power or nuclear facility with a solution with a proven track record of success of 40+ years.

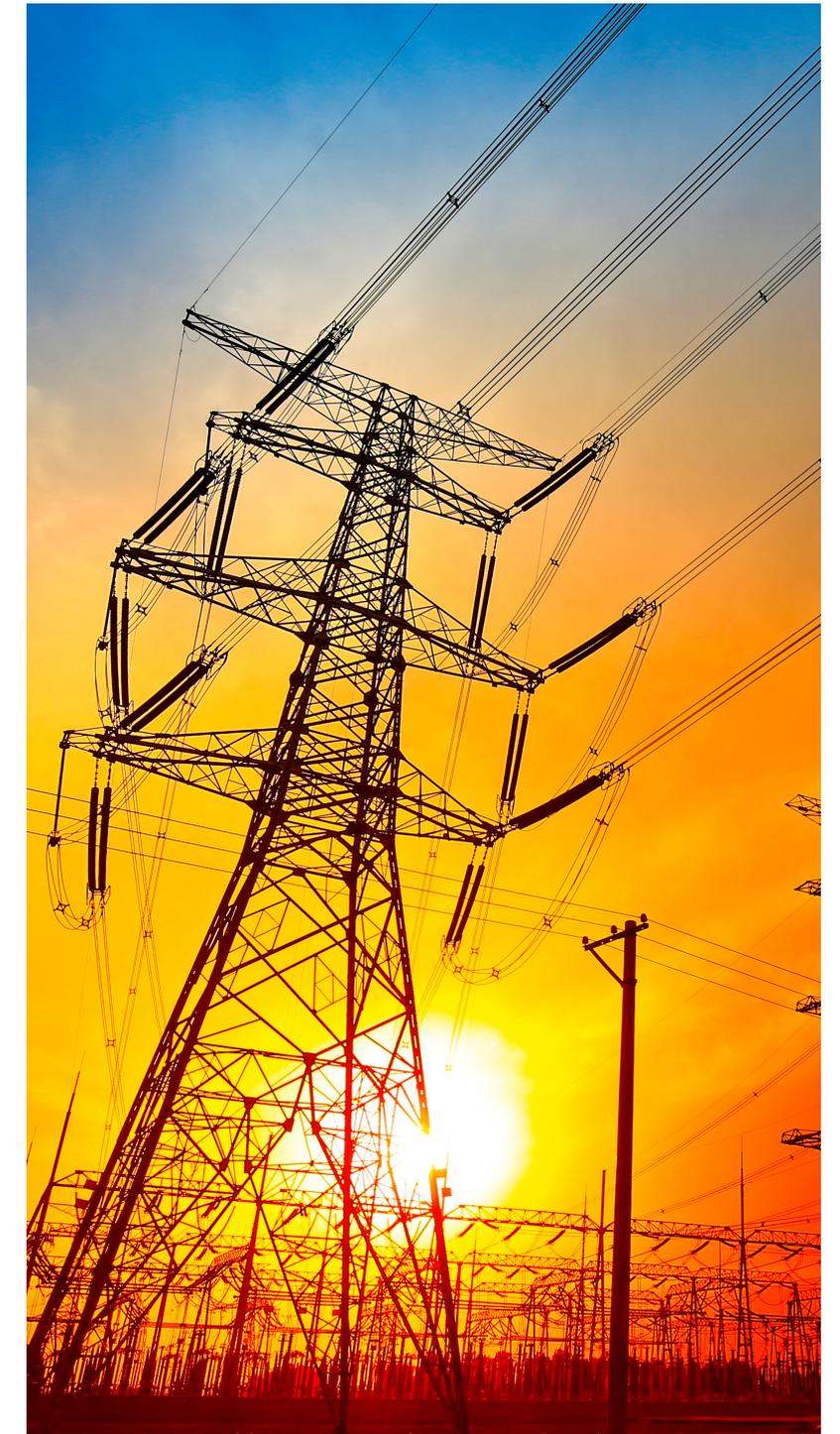
Moving further inside the facility, use Octave Aspect Pipe Stress (formerly CAESAR II) and Aspect Nuclear Pipe Stress (formerly PIPESTRESS) to easily engineer and analyze piping for all types of power-based facilities including those that include nuclear piping classes 1, 2 and 3, in addition to NQA-1. These Octave solutions can be used to design and analyze piping for fuel supply, heat transfer, cooling systems, waste disposal and even safety systems. Using the solutions' analytical solving engines, systems can be designed with standardized piping materials and then analyzed for high pressures, temperature conditions and seismic response to ensure safety and lifetime extension.

Use Aspect Structure to build:

- Reactor, building, vibrating machines and piping, vessel and tank supports
- Skids
- Lifting crane structures
- Steel supports
- Finite element meshing
- Pipe racks and bridges
- Base plates
- Crane beams
- Bracing systems for seismic applications

Use Aspect Pipe Stress to design using:

- Steel Sch. 40
- Typical lightwall steel
- Copper Type M
- CPVC SDR 13.5
- SA 213/312 TP 304/316
- SA 335 GR P11
- ...and more!



Creating piping systems with Octave's analysis solutions encourages better design through contextual decision-making. Piping systems requiring wall penetrations, pipe bridges or intricate pipe frame supports can be created in-tandem with the design of the facility, as analysis solutions can integrate with Octave's design solutions for enhanced communication and collaboration across disciplines.

Diving deeper into the facility's infrastructure, all pressure vessels and related components can be easily engineered and analyzed in Octave's fastest growing pressure vessel solution: Aspect Pressure Vessel (formerly PV Elite).

Aspect Pressure Vessel is an instrumental tool for ensuring facilities' essential assets, like boilers, nuclear reactors, steam generators, hydrogen storage units, heat exchangers, autoclaves and others, are perfectly in sync and operating in harmony.

With departments leveraging Aspect Pressure Vessel's collaborative capabilities, heat exchangers can be designed strategically to recycle heat to other assets within the facility. This optimizes heat use and can considerably reduce the organization's overall energy consumption. Aspect Pressure Vessel also allows for comprehensive pressure and temperature analysis for all these assets, ensuring absolute safety. Paired with design compliance with the latest industry codes, including ASME, EN and others, Aspect Pressure Vessel ensures your facility stays on the cutting edge of safety and efficiency.

Octave's analysis solutions are renowned for accelerating power projects, enhancing quality and driving efficiency. From the outset of your project to the early stages of construction, and throughout a comprehensive 30-year asset maintenance plan, Octave's solutions are an indispensable ally in your energy journey.

"With Aspect Structure, we saved \$1 million in manpower expenses and overall \$3 million in time and resources, performing the evaluation in less than 23 days."

Parimal Gandhi
Lead Engineer, Southern Nuclear

Drive projects with an all-encompassing suite

The most important aspect of digital transformation is its ability to connect all facets of operations and project deliverables within a single digital ecosystem. Octave's team strives to enhance not only the software within this ecosystem but also engineers' efficiency through contributions to power code committees working on standards such as RCC-M, EN 13480 and ASME III.

By entrusting Octave with your design and analysis projects, organizations ensure their assets adhere to high standards of performance and operate safely through code compliance.

Octave offers a full suite of analysis tools for engineering assets for any power project. Combining these tools through intricate but easy-to-use integrations can help organizations break silos and achieve better decision-making through a more complete view of assets.

For further benefits, organizations can unify their analysis data with Octave's data and document management system, that manages all your engineering information. This unification enables the integration of analysis data in your organization, boosting collaboration among various teams and departments.

Main benefits:

- Better project management and insight into performance
- Reduced risk of cost and schedule over-runs
- Accurate and actionable information to enable course corrections
- Consistent updates to the latest codes and regulations
- Contextual guidance to fuel better decision making

Using solutions for:

- Piping design and analysis
- Pressure vessel design and analysis
- Structural design and analysis
- Tank design and analysis



While complex projects are a mainstay in the power industry, cumbersome software doesn't need to be. It's no secret that organizations struggle when deadlines are extended due to design complications or when the context of the analysis isn't fully understood. Easy-to-use, accurate and detailed analysis solutions are paramount to ensuring the safety and reliability of designed assets.

Aspect Pipe Stress

The standard in pipe stress analysis

Aspect Pipe Stress is the industry-standard software for pipe stress analysis, enabling engineers to design and evaluate piping systems of any size, type and complexity. Whether you are working on underground, above-ground, utility or nuclear piping, Aspect Pipe Stress can help you comply with more than 40 international codes and standards, as well as your own custom specifications.

With Aspect Pipe Stress, you can perform static and dynamic analysis, account for wind, wave, seismic, thermal and pressure loads as well as weight and support loads, all the while optimizing your piping design for safety, performance and cost.

As a Aspect Pipe Stress user, you and your organization benefit from Octave Community, accessing webinars, training and support resources. In this environment, you can also share your ideas, feedback and best practices with other Aspect Pipe Stress users and experts.

Aspect Pipe Stress is the trusted choice for thousands of engineers and piping professionals worldwide. The solution complies with ASME NQA-1 quality assurance and enables design per ASME NC, ASME ND and RCC-M C and D. Whether you are designing a new system, modifying an existing one, or performing a fitness-for-service assessment, Aspect Pipe Stress can help you deliver your projects on time, on budget and with confidence.



Aspect Nuclear Pipe Stress

Streamlined nuclear pipe stress calculations

Aspect Nuclear Pipe Stress is the ultimate powerhouse that can revolutionize your nuclear workflow. Its analysis solvers are Octave's solution for designing Class 1 nuclear piping.

As an efficient, streamlined software for nuclear pipe stress calculations, Aspect Nuclear Pipe Stress is certified for use in the nuclear industry (RCC and ASME class 1, 2 and 3) and continuously maintained in compliance with ASME NQA-1.

When faced with demanding nuclear seismic requirements, let Aspect Nuclear Pipe Stress handle rigorous dynamic analyses. Boasting a diverse range of analysis types - from linear and non-linear calculations, heat transfer and thermal gradients to fatigue analysis, strain energy-weighted composite modal damping and time history analysis.

Aspect Nuclear Pipe Stress makes sure you're equipped to tackle any nuclear project challenge. Dive into the future of nuclear pipe stress calculations.

Aspect Pressure Vessel

Industry-leading pressure vessel analysis

Aspect Pressure Vessel stands at the forefront of pressure vessel design and analysis solutions, containing every major code and standard needed to engineer innovative designs for both vessels, heat exchangers and related assets.

Automated 2D and 3D visualization enables easier design, review and analysis, in addition to improved communication between engineers and fabricators, saving valuable time and resources.

With the ability to perform fitness-for-service assessments on older equipment, you can extend the life of your assets and ensure their safety and reliability for years to come. This data can be easily verified using a variety of equations and reporting methods.

Design, analyze and innovate with confidence using Aspect Pressure Vessel while streamlining your workflow to save you time and resources.



Aspect Structure

Comprehensive structural analysis and design

Aspect Structure is a must for any organization seeking to ensure their structures are safe and up-to-code, while at the same time being cost effective and efficient.

With Aspect Structure, engineers can consider weight, pressure, thermal, seismic or any other static or dynamic conditions your power or nuclear facility might face. Aspect Structure also features beam and finite element analysis (FEA), providing a complete range of design codes, including AISC, ACI, Canadian, European, Indian, Chinese and NF codes.

Harnessing this solution, you can validate the viability and integrity of your structural projects anywhere in the world. Trust Aspect Structure for your structural analysis and design needs, and achieve safety, performance and cost-effectiveness.

Octave Aspect Tank (formerly TANK)

Storage tank design and analysis

Transform your oil storage tank analysis with Aspect Tank, the cutting-edge software designed to streamline and enhance your engineering experience. With its intuitive menu-driven interface, Aspect Tank simplifies the complex process of adhering to American Petroleum Institute (API) standards, ensuring precision and reliability in every analysis.

Embrace unparalleled flexibility as Aspect Tank empowers you to select any unit combination for analysis or reporting. Its user-definable unit files liberate engineers from restrictive defaults, offering the freedom to tailor settings to your unique requirements and even convert existing jobs to any unit format with ease.

Aspect Tank's intelligent user interface presents only the necessary information at each step, eliminating the hassle of out-of-sequence data entry. It asks for what's needed, when it's needed, making your workflow as efficient as possible.

Stay compliant with confidence; Aspect Tank performs calculations in strict accordance with the latest API Standards 579, 620, 650, and 653. It also accounts for environmental factors such as wind, seismic activity, and settlement conditions, plus calculates air venting requirements to API 2000 Section 4.3.

Elevate your engineering projects with Aspect Tank— where precision meets flexibility

"We have a long history with Octave: Over 20+ years of experience using the wide range of Octave's software, including engineering, design, analysis and information management solutions. This shows that Octave products have abundant potential to serve the needs of the engineering industry when it comes to generating quality output with maximized efficiency, while saving time and cost."

Samirkumar Patel
AGM-IT- L&T-Chiyoda

An integrated suite for all design and analysis projects

Perform detailed analysis on power and nuclear assets using intuitive and powerful features that save you time and money. Whether you need to design a new asset, retrofit an existing one or optimize your operations, Octave's suite of analysis solutions can do it all.

Discover further benefits by integrating analysis solutions with design solutions, such as Octave Forte 3DWorx (formerly CADWorx) and Forte 3D (formerly Smart 3D) products for more streamlined workflows and better communication across departments and disciplines.

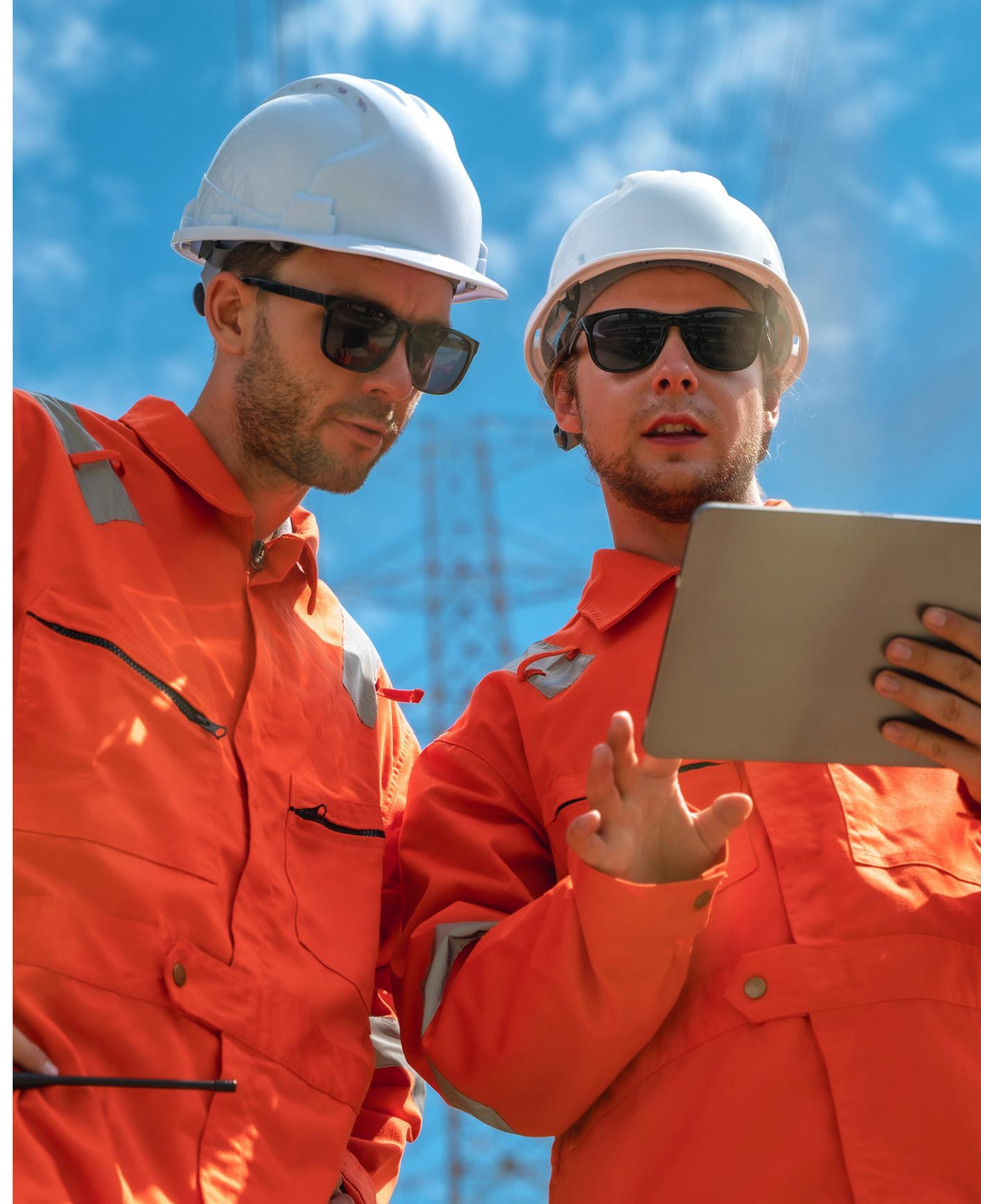
See the benefits of sharing data between products such as Aspect Pressure Vessel and Forte 3DWorx, enabling pressure vessels to be a part of your layout activities and analyzed in Aspect Pressure Vessel. Changes to the design in either product can be reflected in the other, eliminating the need for re-work.

Some power clients have stated that they "often experienced project delays with missed deadlines" before using Octave's solutions. Others have stated that they have saved "considerable time" using integrations between Octave's design and analysis products.

See improved results across multiple design and analysis disciplines by combining data with the power of Octave's data and document management system to integrate and manage all your data and analysis workflows. Benefit from the synergy and insights that come from breaking silos and combining data with solutions that are designed to help you create safe and efficient assets that comply with the latest codes and standards.

So what are you waiting for?

Learn more about what Octave's suite of analysis products can do.



About Octave

eBook

Octave is a leader in enterprise software, turning data into decisive action and intelligence into your edge. Our software solves for and simplifies complexity, from the design and build to operations and protection of people, property, and assets— for any scope, at any scale. For decades, we've partnered with customers to sharpen performance, elevate efficiency, and amplify results. From factory floors to entire cities, our solutions are tuned to scale up what's possible from day one onward.

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