The Gypsum Construction Handbook

NEW! Sixth Edition

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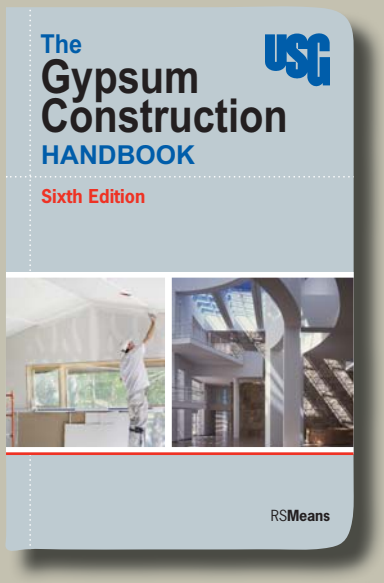


About the Book

Market

Design professionals, contractors, building inspectors, code officials, students, and apprentices.

Description

One of the construction industry's longest-running, most relied-on references, *The Gypsum Construction Handbook* was first published by U.S. Gypsum Company in 1904. For more than a century and through several editions, the book has become a trusted standard.

The *Handbook* covers both new construction and repair and remodeling and includes:

- framing
- drywall and veneer plaster
- joint treatment and plaster finishing
- interior cement board
- ceilings
- conventional plaster

New in this edition are chapters on sustainable construction methods and products, building movement, fire resistance, heat transfer, sound transmission, and vapor/moisture control.

System descriptions – together with full data on products, accessories, tools, equipment, and applications – help plan and estimate projects and ensure compliance with performance criteria. **Cost- and time-saving techniques keep the work on budget.**

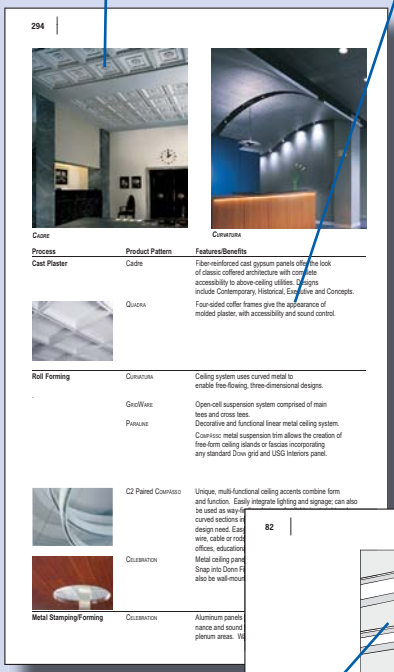
RSMeans USG

Some features of the new *Gypsum Construction Handbook*

Photos of a wide range of projects

Detailed product information

Tools and equipment for all types of gypsum construction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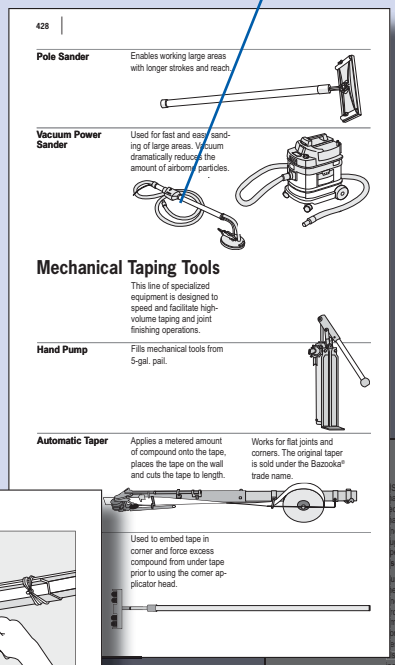
CADRE

CURVATURA

Process	Product Pattern	Features/Benefits
Cast Plaster	Cadre	Fiber-reinforced cast gypsum panels offer the look of classic coffered architecture with complete accessibility to above-ceiling utilities. Designs include Contemporary, Historical, Executive and Concepts.
	Quadra	Four-sided coffer frames give the appearance of molded plaster, with accessibility and sound control.
Roll Forming	Curvatura	Ceiling system uses curved metal to enable free-flowing, three-dimensional designs.
	GridWare	Open-cell suspension system comprised of main tees and cross tees.
	Parkline	Decorative and functional linear metal ceiling system.
	Compass	metal suspension trim allows the creation of free-form ceiling islands or fascias incorporating any standard Donn grid and USG Interiors panel.
	C2 Paired Compass	Unique, multi-functional ceiling accents combine form and function. Easily integrate lighting and signage; can also be used as way-f curved sections i design need. Eas wire, cable or rod offices, educations
	Celebration	Metal ceiling pane Snap into Donn-F also be wall-mount
Metal Stamping/Forming	Celebration	Aluminum panels nance and sound plenum areas. W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Pole Sander — Enables working large areas with longer strokes and reach.

Vacuum Power Sander — Used for fast and easy sanding of large areas. Vacuum dramatically reduces the amount of airborne particles.

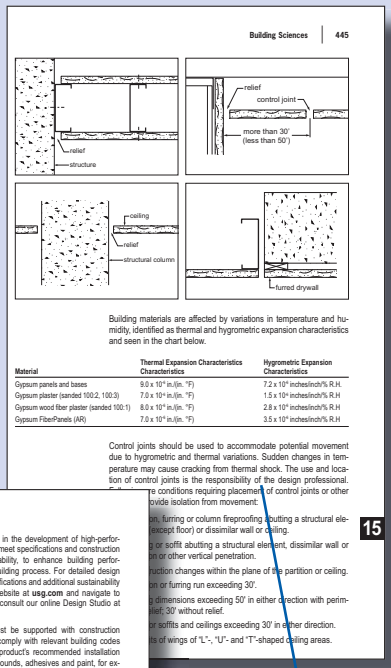
Mechanical Taping Tools

This line of specialized equipment is designed to speed and facilitate high-volume taping and joint finishing operations.

Hand Pump — Fills mechanical tools from 5-gal. pail.

Automatic Taper — Applies a metered amount of compound onto the tape, places the tape on the wall and cuts the tape to length. Works for flat joints and corners. The original taper is sold under the Bazooka® trade name.

Used to embed tape in corner and force excess compound from under tape prior to using the corner applicator head.


Building Sciences | 445

relief
control joint
more than 30'
(less than 50')
relief
structure
ceiling
relief
structural column
furred drywall

Building materials are affected by variations in temperature and humidity, identified as thermal and hygrometric expansion characteristics and seen in the chart below.

Material	Thermal Expansion Characteristics Characteristics	Hygrometric Expansion Characteristics
Gypsum panels and bases	9.0 x 10⁻⁶ in./(in. °F)	7.2 x 10⁻⁴ inches/inch/% R.H.
Gypsum plaster (sanded 100:2, 100:3)	7.0 x 10⁻⁶ in./(in. °F)	1.5 x 10⁻⁴ inches/inch/% R.H
Gypsum wood fiber plaster (sanded 100:1)	8.0 x 10⁻⁶ in./(in. °F)	2.8 x 10⁻⁴ inches/inch/% R.H
Gypsum FiberPanels (AR)	7.0 x 10⁻⁶ in./(in. °F)	3.5 x 10⁻⁴ inches/inch/% R.H

Control joints should be used to accommodate potential movement due to hygrometric and thermal variations. Sudden changes in temperature may cause cracking from thermal shock. The use and location of control joints is the responsibility of the design professional. [illegible] conditions requiring placement of control joints or other [illegible] isolation from movement:

[illegible], furring or column fireproofing, abutting a structural element, dissimilar wall or ceiling (except floor) or dissimilar wall or ceiling.

[illegible] or soffit abutting a structural element, dissimilar wall or [illegible] or other vertical penetration.

[illegible] changes within the plane of the partition or ceiling.

[illegible] or furring run exceeding 30'.

[illegible] dimensions exceeding 50' in either direction with perim[illegible]ief; 30' without relief.

[illegible] soffits and ceilings exceeding 30' in either direction.

[illegible] of wings of "L"-, "U"- and "T"-shaped ceiling areas.

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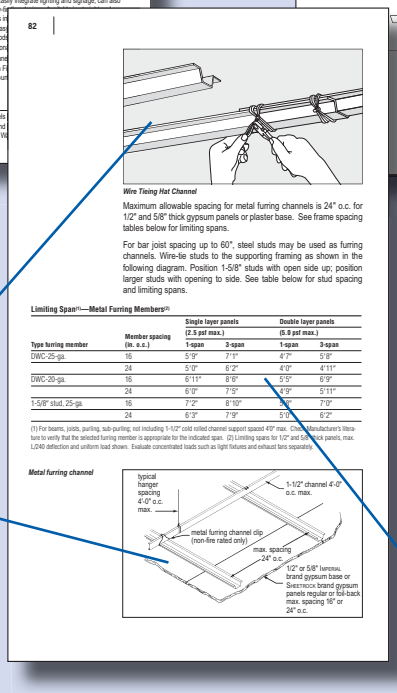
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Wire Tieing Hat Channel

Maximum allowable spacing for metal furring channels is 24" o.c. for 1/2" and 5/8" thick gypsum panels or plaster base. See frame spacing tables below for limiting spans.

For bar joist spacing up to 60", steel studs may be used as furring channels. Wire-tie studs to the supporting framing as shown in the following diagram. Position 1-5/8" studs with open side up; position larger studs with opening to side. See table below for stud spacing and limiting spans.

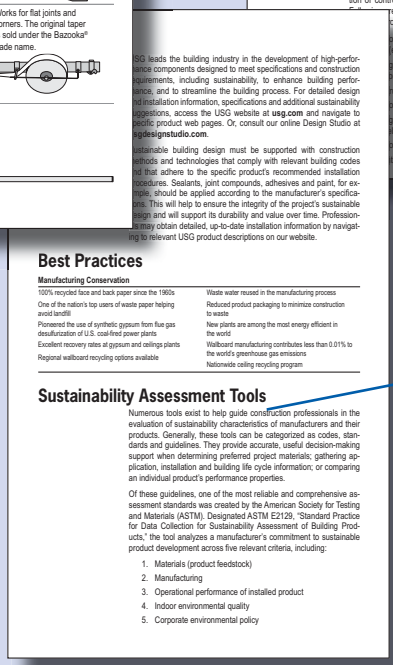
Limiting Span(1)—Metal Furring Members(2)

Type furring member	Member spacing (in. o.c.)	Single layer panels (2.5 psf max.) 1-span	Single layer panels (2.5 psf max.) 3-span	Double layer panels (5.0 psf max.) 1-span	Double layer panels (5.0 psf max.) 3-span
DWC-25-ga.	16	5'9"	7'1"	4'7"	5'8"
	24	5'0"	6'2"	4'0"	4'11"
DWC-20-ga.	16	6'11"	8'6"	5'5"	6'9"
	24	6'0"	7'5"	4'9"	5'11"
1-5/8" stud, 25-ga.	16	7'2"	8'10"	5'8"	7'0"
	24	6'3"	7'9"	5'0"	6'2"

(1) For beams, joists, purlins, sub-purlins; not including 1-1/2" cold rolled channel support spaced 4'0" max. Check Manufacturer's literature to verify that the selected furring member is appropriate for the indicated span. (2) Limiting spans for 1/2" and 5/8" thick panels, max. L/240 deflection and uniform load shown. Evaluate concentrated loads such as light fixtures and exhaust fans separately.

Metal furring channel

typical hanger spacing 4'-0" o.c. max.
1-1/2" channel 4'-0" o.c. max.
metal furring channel clip (non-fire rated only)
max. spacing 24" o.c.
1/2" or 5/8" Imperial brand gypsum base or Sheetrock brand gypsum panels regular or foil-back max. spacing 16" or 24" o.c.


[illegible]SG leads the building industry in the development of high-performance components designed to meet specifications and construction [illegible]quirements, including sustainability, to enhance building performance, and to streamline the building process. For detailed design [illegible]d installation information, specifications and additional sustainability [illegible]ggestions, access the USG website at **usg.com** and navigate to [illegible]ecific product web pages. Or, consult our online Design Studio at **[illegible]sgdesignstudio.com**.

[illegible]stainable building design must be supported with construction [illegible]thods and technologies that comply with relevant building codes [illegible]d that adhere to the specific product's recommended installation [illegible]ocedures. Sealants, joint compounds, adhesives and paint, for example, should be applied according to the manufacturer's specifications. This will help to ensure the integrity of the project's sustainable [illegible]sign and will support its durability and value over time. Professionals may obtain detailed, up-to-date installation information by navigating to relevant USG product descriptions on our website.

Best Practices

Manufacturing Conservation

- 100% recycled face and back paper since the 1960s
- One of the nation's top users of waste paper helping avoid landfill
- Pioneered the use of synthetic gypsum from flue gas desulfurization of U.S. coal-fired power plants
- Excellent recovery rates of gypsum and ceilings plants
- Regional wallboard recycling options available
- Waste water reused in the manufacturing process
- Reduced product packaging to minimize construction to waste
- New plants are among the most energy efficient in the world
- Wallboard manufacturing contributes less than 0.01% to the world's greenhouse gas emissions
- Nationwide ceiling recycling program

Sustainability Assessment Tools

Numerous tools exist to help guide construction professionals in the evaluation of sustainability characteristics of manufacturers and their products. Generally, these tools can be categorized as codes, standards and guidelines. They provide accurate, useful decision-making support when determining preferred project materials; gathering application, installation and building life cycle information; or comparing an individual product's performance properties.

Of these guidelines, one of the most reliable and comprehensive assessment standards was created by the American Society for Testing and Materials (ASTM). Designated ASTM E2129, "Standard Practice for Data Collection for Sustainability Assessment of Building Products," the tool analyzes a manufacturer's commitment to sustainable product development across five relevant criteria, including:

1. Materials (product feedstock)
2. Manufacturing
3. Operational performance of installed product
4. Indoor environmental quality
5. Corporate environmental policy

New Chapters on Sustainability and Building Sciences

Clear illustrations show installation methods and product and system details

Handy charts with product data and installation requirements

About USG

Since 1902, USG has been a leading producer of gypsum plaster and cement products, including SHEETROCK® Brand Drywall Systems and DUROCK® Brand Cement Board. USG is world-renowned for both its leading-edge products and for the extensive information and customer support the company provides.

About RSMeans

RSMeans, the foremost source of construction cost information in North America, is owned by Reed Construction Data (www.reedconstructiondata.com), a leading provider of quality construction information products and services and part of Reed Elsevier (NYSE: RUK and ENL) – a world-leading publisher and information provider.